FINAL

Remedial Investigation Report for Installation Restoration Program Operable Unit 10, Iowa Army Ammunition Plant, Middletown, Iowa[1]

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[1] Explosive Disposal Areas: East Burn Pads (EBPs), West Burn Pad Area (WBPA), North Burn Pads (NBPs), North Burn Pad Landfill (NBPLF), Fire Training Pit (FTP)

Executive Summary

This Remedial Investigation (RI) Report for Operable Unit 10 (OU-10) presents the results of RI activities for the environmental sites within the Explosives Disposal Area (EDA) at the Iowa Army Ammunition Plant (IAAAP), in Middletown, Iowa. The EDA consists of seven environmental sites within five areas: East Burn Pads (EBPs) (IAAP-012G), West Burn Pad Area (WBPA) (IAAP-032G, IAAP-003-R-01, and IAAP-005-R-01), North Burn Pads (NBPs) (IAAP-036G), North Burn Pad Landfill (NBPLF) (IAAP-037G), and Fire Training Pit (FTP) (IAAP-039G). The RI was conducted in accordance with the *Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant, Middletown, Iowa* (CH2M 2017a). This RI was completed under Delivery Order W912QR21F0421 of U.S. Army Corps of Engineers, Louisville District, Contract No. W912QR21D0019.

The IAAAP consists of 19,011 acres adjacent to Middletown, in Des Moines County, Iowa (Figure 1-1). It is approximately 8 miles west of Burlington, which with a population of 25,436, is the largest city in Des Moines County. The IAAAP is an active Joint Munitions Command facility currently operated by civilian contractor American Ordnance, LLC. The current mission of the IAAAP is to load, assemble, and pack ammunition items, including projectiles, mortar rounds, warheads, demolition charges, and munitions components such as fuses, primers, and boosters.

Due to explosives-contaminated surface water leaving the installation boundaries, the IAAAP was placed on the National Priorities List in August 1990. In September 1990, a Federal Facility Agreement was signed by the U.S. Environmental Protection Agency (USEPA) Region 7 and the U.S. Army; it became effective in December 1990. Through the Federal Facility Agreement, the U.S. Army works with the USEPA, with support provided by the Iowa Department of Natural Resources (IDNR). In accordance with the Federal Facility Agreement, "Site" refers to the IAAAP and any areas contaminated by the migration of hazardous substances from the IAAAP. The term "site" is used to refer to the environmental solid waste management units and areas of concern at the IAAAP (such as IAAP-012); this is consistent with Section IX.B of the 2018 Resource Conservation and Recovery Act (RCRA) Permit for the IAAAP.

The IAAAP was placed under the U.S. Department of Defense Installation Restoration Program (IRP), which follows the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) process, as amended by the Superfund Amendments and Reauthorization Act. In July 2002, several areas of the IAAAP previously used by the former Atomic Energy Commission were designated by U.S. Army Corps of Engineers to be under the Formerly Utilized Sites Remedial Action Program (FUSRAP) and therefore were subsequently removed from the U.S. Department of Defense IRP (U.S. Army, 2007).

The IAAAP is currently divided into eight operable units (OUs), described below (USACE, 2016):

- OU-1 (soils): soil on the IAAAP other than those contaminated by use or testing of military munitions or by radiological constituents.
- OU-3 (offsite groundwater): groundwater outside of the IAAAP boundary.
- OU-4 (Inert Disposal Area): the Inert Disposal Area and its associated landfills, trenches, and sedimentation ponds.
- OU-5 (Military Munitions Response Program): Military Munitions Response Program sites.
- OU-6 (Onsite Groundwater): groundwater within the IAAAP boundary.
- OU-7 (Installation-wide): miscellaneous IAAAP sites not included in the other OUs.
- OU-8 (FUSRAP): sites contaminated by radiological and other contaminants by former Atomic Energy Commission activities and now being addressed by FUSRAP.

- OU-9 (construction): construction debris disposal sites.

OU-2 was also established originally for soil removal actions but was subsequently merged into OU-1. OU-4 was originally considered the installation-wide OU; however, in October 2009, the previously unaddressed areas of soil contamination were placed in OU-7, and the Inert Disposal Area remained in OU-4 (Tetra Tech, 2011a). Because the Compliance Cleanup (CC) sites were managed under RCRA, they do not currently fall within an OU.

To streamline the CERCLA process, three new OU divisions (OU-10, OU-11, and OU-12) are being proposed based on recommended remedial actions for the IAAAP sites. The OU-10 grouping is proposed for IAAAP groundwater sites in the EDA. The OU-11 grouping is proposed for miscellaneous IAAAP sites that warrant a NFA decision. The OU-12 grouping is proposed for IAAAP sites that were formally managed under the CC program. This RI report includes sites that are recommended for inclusion in the proposed OU-10 grouping.

The overall objectives of this RI were to update the conceptual site model for each site, assess the potential for unacceptable human health risks and hazards and the potential for ecological impacts (including identification of chemicals of concern [COCs] or chemicals of ecological concern), and recommend a path forward consistent with the *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final* (USEPA, 1988). This report presents the results of RI activities for the IAAAP sites within the EDA.

Background values were established for metals in soil and groundwater at IAAAP; the same background data sets were used for both the human health and ecological risk evaluations. The soil background values were obtained from the *Reevaluation of Background Concentrations of Metals in Soil* (Jacobs, 2022). Groundwater background values were obtained from the *Evaluation of Background Concentrations of Metals in Groundwater* technical memorandum (CH2M, 2020a).

This RI document reflects certain procedural departures from the standard USEPA human health risk assessment (HHRA) process that the Army routinely applies at its installations (USEPA 1989). An example is the inclusion in the HHRA of onsite detected chemicals with concentrations that are either the same or less than those of their respective site-specific background concentrations (naturally occurring chemicals). Such an approach adds extraneous information into the HHRA process.

However, this background comparison method is consistent with Worksheet #14 of the *Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant, Middletown, Iowa* (CH2M, 2017a). Although inconsistent with the process the Army uses for background in the HHRA for their installations, this method complies with the requests from the USEPA in a memorandum from the USEPA Region 7 Remedial Project Manager to the IAAAP Project Manager (USEPA, 2019).

IAAAP Site-specific Descriptions

This report presents the results of RI activities for seven environmental sites (IAAP-012G, IAAP-032G, IAAP-003-R-01, IAAP-005-R-01, IAAP-036G, IAAP-037G, and IAAP-039G) within the following five areas of the EDA:

- **East Burn Pads (EBPs) (IAAP-012G):** This RI report addresses groundwater at the EBPs area, which encompasses 12 acres and is located in the northeast portion of the IAAAP facility (Figure 5.4-1). Soil at the EBPs is addressed under the remedy for OU-1 (IAAP-012) (Leidos, 2018). The EBPs are immediately east of Spring Creek. The EBPs previously contained eight burning pads, and this area was active between 1949 and 1982 for operations that included open burning of explosives-contaminated metals, propellants, explosives, and pyrotechnics-contaminated materials. Operations ceased at the EBPs in 1982 once the Explosives Waste Incinerator (EWI) was constructed, and there are no remaining structures in this area.

- **West Burn Pad Area (WBPA) (IAAP-032G, IAAP-003-R-01, and IAAP-005-R-01):** This RI report addresses groundwater, surface water, and sediment at the WBPA. Soil at the WBPA is addressed under the remedies for OU-1 (IAAP-032) (Leidos, 2018). The WBPA encompasses approximately 14 acres within the Spring Creek watershed, immediately west of Spring Creek (Figure 5.4-1). The WBPA was used for demilitarization by open burning, which was performed at former burn pads located within the WBPA. Burning operations were also performed within metal cages at the Burn Cages. Waste material from the burning operations at the burn pads and burn cages were disposed of at the WBP Landfill and Burn Cage Ash Landfill, located in the western and eastern portions of the WBPA, respectively. The WBPA was also used for munitions response activities, to flash explosives-contaminated metal parts and store salvageable metal parts. The WBPA was active starting in 1947 and operations ceased at the WBPA in 1982 once the EWI was constructed. The Atomic Energy Commission also conducted activities at the WBPA between 1947 and 1975. Two buildings are present at the WBPA, Building BG-13 and office Building 500-183, and a road runs through the center of the WBPA connecting to the EBPs. An underground viewing bunker is present near Building 500-183.
- **North Burn Pads (NBPs) (IAAP-036G):** This RI report addresses groundwater at the NBPs, which encompasses approximately 4 acres and is located north of the WBPA in the Spring Creek watershed (Figure 5.4-1). Soil at the NBPs is addressed under the remedy for OU-1 (IAAP-036) (Leidos, 2018). The NBPs consisted of two former earthen burn pads, which were active between 1968 and 1972 for open burning of lead azide and gun powder. A former 275-gallon diesel-refueling station was also present at the base of one of the burn pads, Pad 2-N. There are no remaining structures onsite.
- **North Burn Pad Landfill (NBPLF) (IAAP-037G):** This RI report addresses groundwater at the NBPLF, which encompasses approximately 3 acres and is located 800 feet north of the NBPs in the Spring Creek watershed (Figure 5.4-1). Soil at the NBPLF is addressed under the remedy for OU-1 (IAAP-037) (Leidos, 2018). The NBPLF consists of a former landfill measuring 60 by 470 feet that was capped with clay during cleanup operations in 1980. Residual ash and flashed cans, containers, and construction debris from the NBPs and EDA were disposed of at the NBPLF. One building, BG-199-4, is present at the NBPLF and is currently used as a breakroom for American Ordnance staff. Additional activities at this site include waste disposal of waste slightly contaminated with explosives and RCRA 90-day hazardous waste storage of paint filters, which are shipped offsite for disposal.
- **Fire Training Pit (FTP) (IAAP-039G):** This RI report addresses groundwater at the FTP area, which includes the former training pit and adjacent areas and facilities to the east and southeast (Figure 5.4-1). Soil at the FTP area is addressed under the remedy for OU-1 (IAAP-039) (Leidos, 2018). The FTP encompasses approximately 2 acres and includes a former smoke trainers vault (Building 200-30); two former burn pits located southeast of the smoke trainers vault; and a former disposal pit located between the smoke trainers vault and the burn pits. The FTP area was used between 1970 and 1988 for firefighting training operations that consisted of placing solvents or fuels in 55-gallon drums within the FTP, igniting the solvents, and then extinguishing the fire using fire suppression foam. Note that the FTP was identified as an area of potential interest (AOPI) during a Preliminary Assessment for per- and polyfluoroalkyl substances (PFAS) at IAAAP (Arcadis, 2020). The PFAS AOPIs are currently under a site inspection, and therefore PFAS is not a component of this OU-10 RI.

Remedial Investigation Conclusions

The following RI and risk assessment conclusions were derived for each IAAAP area.

EBPs (IAAP-012G)

Potential sources of contamination at the EBPs include historical activities associated with open burning of explosives-contaminated metals, propellants, explosives, and pyrotechnics-contaminated materials. Available documentation does not indicate that petroleum fuels or other liquid accelerants were used for open burning operations. Explosive powder that was used to initiate the flashing was spread on top of materials placed on the burn pads. Live ordnance was not demilitarized (Tetra Tech, 2006). Scrap metal was recovered for offsite recycling, and ash and other debris were disposed of offsite. Operations at the EBPs ceased once the EWI was constructed in 1982.

Based on historical site operations and a comparison of the most current concentration data to site characterization project action limits (PALs) and background threshold values (BTVs), only Royal Demolition Explosive (RDX) was identified as a potential site-related chemical of interest in groundwater. RDX groundwater contamination is present as one large plume, which exists primarily within the overburden aquifer. It was detected above its site characterization PAL in only four overburden and shallow bedrock monitoring wells during the latest sampling events (EBP-MW3, EBP-MW4, EBP-MW5, and EDA-2). Although RDX concentrations in three out of the four wells have decreased since late 2007, increasing trends at monitoring wells EBP-MW4 and EDA-3, located at the leading edge of the plume, may be indicative of some plume migration. However, the overburden aquifer is absent in the western portion of the site, where it pinches out and bedrock outcrops to the surface. Along with the slow groundwater flow velocity, this may be limiting the extent of plume migration. As such, no RDX exceedances have been observed in the most downgradient monitoring wells at the site. The RDX plume is considered to be laterally and vertically delineated.

The soil removal that was completed in 1999 is assumed to have removed the bulk of RDX contamination that could be a source to groundwater. Although initial confirmation sampling showed RDX concentrations above the OU-1 leachability-based remediation goal (RG) (1.3 mg/kg) at Pads 1E, 2E, 4E, 5E, 6E, and 8E, an additional 1 to 2 feet of soil was excavated in these areas following the confirmation sampling. Because a second round of confirmation sampling was not conducted, it is unknown whether RDX concentrations in soil still exceeded the leachability goal at the EBPs.

The HHRA did not identify any unacceptable risks or hazards for future residential receptors exposed to site-related chemicals in soil or groundwater at the EBPs. The Ecological Risk Assessment (ERA) concluded that no adverse effects to ecological receptors exist at the EBPs, given the lack of complete exposure pathways for ecological receptors.

WBPA (IAAP-032G)

Potential sources of contamination at WBPA include historical activities associated with open burning demilitarization activities and burning and disposal of dunnage. Open burning was performed on a variety of munitions debris and related materials, including explosives-contaminated metals parts and inert and explosives-contaminated packaging. Recoverable metal was segregated for offsite recycling and reuse subsequent to burning. Land disposal was performed at onsite landfills for other wastes from burning operations, including ash, paper, wood, and metal cans. Burning and disposal operations at the WBPA ceased after the EWI was constructed in 1982.

Based on historical site operations and a comparison of the most current concentration data to site characterization PALs and BTVs, three explosives (RDX, 2,6-dinitrotoluene, and 1,3-dinitrobenzene), four volatile organic compounds (VOCs) (1,1,2-trichlorotrifluoroethane [Freon 113], 1,1-dichloroethane, 1,1-dichloroethene, and trichloroethene [TCE]) and one metal (arsenic) were identified as potential site-related chemicals of interest in groundwater. RDX is the most extensive chemical, and the other explosives are present within the RDX plume extents. RDX is present primarily as one large plume, which exists primarily within the overburden and shallow bedrock aquifers. The soil removals are assumed to have removed the bulk of RDX contamination that could be a source to groundwater. However, confirmation samples collected in 2000 from the four excavation areas (WBP Landfill, Pad 2-W, Burn Cage Ash Landfill, and Pad 1-W) indicated that RDX was still present above OU-1 leachability RGs (ECC, 2001), which could be a continuing source at the WBPA. VOCs are present in three plumes at the WBPA, two in the northern portion of the WBPA and one in the eastern portion of the WBPA. Of note is a large VOC plume that extends into the southeastern corner of the WBPA; however, this plume is associated with the FTP site (IAAP-039). Arsenic exceeded its PAL and BTV at only one well in 2019.

A groundwater treatability study was conducted from 2005 through 2009 in the northwest portion of the RDX plume, near WBP-TTMW-05B, and in the southeast portion of the RDX plume, near WBP-99-3, where historically the highest RDX and Freon 113 concentrations had been observed. Stable and decreasing RDX concentrations are north and east of the RDX plume; however, some increasing trends may be indicative of some plume migration or rebound following the treatability study injections. However, the slow groundwater flow velocity should be limiting the extent of plume migration. The RDX plume is considered to be laterally and vertically delineated for this RI.

In surface water, only dissolved aluminum was detected above its site characterization PAL and BTV in 2019, downstream of the EDA. Dissolved aluminum was not detected upstream of the EDA in 2019. No site-related chemicals of interest were identified for sediment.

The HHRA identified potentially unacceptable risks for future hypothetical residential receptors exposed to site-related chemicals in groundwater at the WBPA, including VOCs, explosives, and arsenic. The HHRA also identified potentially unacceptable risks associated with exposure to Freon 113, 1,3-dinitrobenzene, 2,6-dinitrotoluene, arsenic, chloroform, dichlorodifluoromethane, RDX, and TCE for current and/or future site workers and to TCE for construction/utility workers. The HHRA concluded that there are no unacceptable risks or hazards for hypothetical residents from exposure to surface water or sediment at the WBPA.

The ERA concluded that no adverse effects to ecological receptors exist at the WBPA. Surface water and sediment data were evaluated in the 2022 Watershed ERA (Appendix I) for the Spring Creek watershed. From the Screening Level Ecological Risk Assessment, copper and silver in sediment were identified as chemicals of potential ecological concern (COPECs); these COPECs were carried forward into the Baseline Ecological Risk Assessment. No chemicals were identified as COPECs in surface water. Following the weight-of-evidence evaluation, no COPECs were identified for Spring Creek. The recommendation of NFA for the Spring Creek watershed based on the results of the Watershed ERA means that no ecological impacts are expected at the WBPA.

NBPs (IAAP-036G)

Potential sources of contamination at NBPs include historical activities associated with open burning activities, including of lead azide and gunpowder. Incomplete combustion of explosives compounds and metals from ash released to soil may have leached into groundwater.

Based on historical site operations and a comparison of the most current concentration data to site characterization PALs and BTVs, no contaminants were detected as potential site-related chemicals of interest in groundwater. Historically, explosives, VOCs, and metals were identified as chemicals of interest in groundwater at the NBPs; however, metals and VOCs have been detected below screening criteria since 2000, and no explosives were detected above their respective PALs in 2019. Freon 113 was detected in groundwater in one well in 2019; however, concentrations were below the site characterization PAL, which differs from the screening value used for HHRA. This well (JAW-13) is located near the southern boundary of the NBPs and may represent the northern edge of VOCs observed in groundwater at the WBPA. Given the lack of RDX in groundwater during the current RI, the soil removal that was completed in 1998 is assumed to have removed RDX contamination that could be a source to groundwater.

The HHRA identified potentially unacceptable hazards (hazard index [HI] is greater than 1) from exposure to Freon 113 (HI = 5 for adult and child future hypothetical resident) through a potential vapor intrusion pathway. Therefore, this analyte was identified as a potential vapor intrusion COC for future hypothetical residents. However, the current and expected future Land Use of the IAAAP is Commercial/Industrial so future exposures to residents is not likely. The ERA concluded that no adverse effects to ecological receptors exist at the NBPs, given the lack of complete exposure pathways for ecological receptors.

NBPLF (IAAP-037G)

Potential sources of contamination at NBPLF include historical activities associated with releases to the surface and subsurface as a result of historical site operations, including burial of waste within the NBPLF. The NBPLF was formerly used for disposal of ash residue from NPB burning operations as well as flashed cans, containers, and construction debris. The site is no longer an active landfill and is currently used for temporary waste storage, including slightly contaminated explosives waste, which is placed in dumpsters and shipped offsite for disposal at approved facilities.

Based on historical site operations and a comparison of the most current concentration data to site characterization PALs and BTVs, only one explosive (RDX) was identified as a potential site-related chemical of interest in groundwater. RDX contamination has been observed as two small plumes at the NBPLF. The main RDX plume is present at the NBPLF to the east of the former landfill and is restricted to within the shallow bedrock. The second RDX plume is isolated and was historically defined by former overburden well JAW-625. However, RDX was not detected in nearby NBPLF-MW1 during the current RI. Therefore, RDX concentrations in this second plume may have attenuated below the site characterization PAL. Explosives were detected above their site characterization PALs in only three shallow bedrock monitoring wells in 2019 and 2020 (JAW-627, NBPLF-MW4, and NBPLF-MW6). RDX concentrations at JAW-627 have been increasing since 2001. The soil removal that was completed in 1998 is assumed to have removed the bulk of RDX contamination that could be a source to groundwater. Confirmation sampling showed one RDX concentration (2.5 mg/kg) within the former NBPLF above the OU-1 leachability-based RG (1.3 mg/kg). However, the increasing RDX concentrations at JAW-627 indicate there may still be a source of RDX leaching to groundwater from the former landfill. Increasing RDX concentrations may also be indicative of continued plume migration. No RDX was detected in surface water samples collected in 2018, due northeast and southeast of the NBPLF, which indicates that the eastern plume is defined. The RDX is considered to be laterally and vertically delineated for this RI.

The HHRA did not identify any unacceptable risks or hazards for future residential receptors exposed to site-related chemicals in soil or groundwater at the NBPLF. The ERA concluded that no adverse effects to ecological receptors exist at the NBPLF, given the lack of complete exposure pathways for ecological receptors.

FTP (IAAP-039G)

Potential sources of contamination at FTP area include historical activities associated with chemical use, burning, and disposal. The former training pit was used for firefighting training operations between 1982 and 1987. Two smaller pits existed to the north of the main training pit: one disposal pit contained trash and debris, and another pit was used to burn wastes similar to those used in the firefighting practices in the main pit, though this disposal pit was not used for firefighter training.

Based on historical site operations and a comparison of the most current concentration data to site characterization PALs and BTVs, VOCs, explosives, and arsenic were identified as potential site-related chemicals of interest in groundwater. Numerous VOCs associated with chlorinated solvents, fuels, and associated breakdown products have been detected at the FTP. Historically, 1,1-dichloroethene and 1,1-dichloroethane have exceeded their PALs with the greatest frequency. VOC groundwater contamination is present as one large plume, with the majority of VOC contamination within the footprint of the former main training pit and a soil removal area. The explosives plume is isolated to the sump well (SA-99-1), located within the soil removal area. Arsenic groundwater contamination was observed within the vicinity of the former training pit and soil removal area and arsenic concentrations have been fairly consistent in this area since 2001. The slow groundwater flow velocity and natural attenuation processes are likely helping to limit the extent of plume migration. As such, no contaminant exceedances have been observed in the most downgradient monitoring wells in this area. The VOC plume is considered to be laterally and vertically delineated for this RI.

The HHRA identified potentially unacceptable risks for future residential receptors exposed to site-related chemicals in groundwater at the FTP, including VOCs, explosives, and arsenic. The HHRA also identified potentially unacceptable risks associated with exposure to 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 4-amino-2,6-dinitrotoluene, arsenic, benzene, cis-1,2-dichloroethane, ethylbenzene, methylene chloride, naphthalene, TCE, and vinyl chloride for site workers; and benzene, naphthalene, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, tetrachloroethene, toluene, TCE, vinyl chloride, m,p-xylene, and o-xylene for construction/utility workers. The ERA concluded that no potential adverse effects to ecological receptors exist at the FTP, given the lack of complete exposure pathways for ecological receptors.

Recommendations

It is recommended that the five IAAAP groundwater sites (IAAP-012G, IAAP-032G, IAAP-036G, IAAP-037G, and IAAP-039G) included in this RI report be transferred to a new OU (OU-10). The new OU-10 grouping will include Environmental Restoration sites located within the EDA. Based on the RI conclusions and results of human health risk assessments and ecological risk assessments, the following is also recommended:

- Conduct a Feasibility Study (FS) for three sites (IAAP-032G, IAAP-036G, and IAAP-039G) associated with groundwater at the WBPA, NBPs, and the FTP to evaluate remedial alternatives to address the unacceptable risks or hazards from site-related COCs in groundwater. If appropriate, it is recommended that TCE reductive degradation products (such as cis-1,2-DCE and vinyl chloride) be included in the monitoring plans of the FS remedial alternatives. NFA is warranted for surface water and sediment at the WBPA under IAAP-032G.

- Propose a NFA decision in a Proposed Plan as the preferred remedy for one site (IAAP-012G associated with groundwater at the EBPs. This recommendation is based on the fact that site-related chemicals do not pose potentially unacceptable risks or hazards. This IAAAP site can subsequently be closed under an NFA Record of Decision for OU-10.

- Conduct a Supplemental Remedial Investigation (SRI) for one site (IAAP-037G). The results of the RI and risk assessments indicate that site-related chemicals do not pose potentially unacceptable risks or hazards. However, because increasing RDX concentrations have been observed in groundwater at JAW-627 and not all RDX in soil was removed at this site to the OU-1 leachability RG, additional groundwater monitoring at JAW-627 is recommended to provide a further line of evidence that a NFA decision is warranted for the NBPLF.

- Retain the two munition IAAAP sites (IAAP-003-R-01 and IAAP-005-R-01) under OU-5. These two Military Munitions Response Program sites have already been closed as NFA for munitions and explosives of concern (MEC) and munitions chemicals (MC) under the OU-5 ROD (CB&I, 2014); therefore, no additional action is needed for these sites and they can remain closed. These recommendations for the OU-5 sites can be documented in the next five-year review report for IAAAP, which includes the IRP OUs with remedies in place (OU-1, OU-3, OU-4, and OU-5).

- Repair the new EDA staff gauges to obtain accurate measurements in the future. Between staff gauge installation in 2018 and the 2019 RI gauging event, the three new staff gauges (EDA-1 through EDA-3) were damaged.

The recommendations for the EDA sites are summarized below:

RI Recommendation	Army Environmental Database Information	
	Site Number	**Site Name**
FS for groundwater under OU-10	IAAP-036G	North Burn Pads Groundwater
	IAAP-039G	Fire Training Pit Groundwater
FS for groundwater and NFA for surface water and sediment under OU-10	IAAP-032G	West Burn Pad Area Groundwater
NFA for groundwater under OU-10	IAAP-012G	East Burn Pads Groundwater
SRI for groundwater under OU-10	IAAP-037G	North Burn Pad Landfill Groundwater
NFA under OU-5[a]	IAAP-003-R-01	West Burn Pads
	IAAP-005-R-01	West Burn Pads South of Road

[a] NFA is already documented in the OU-5 ROD.

Contents

Appendixes

Tables

Figures

Acronyms and Abbreviations

°C	degree(s) Celsius
µg	microgram(s)
ACCLPP	Advisory Committee on Childhood Lead Poisoning Prevention
ADAF	age-dependent adjustment factor
amsl	above mean sea level
AO	American Ordnance, LLC
AOPI	area of potential interest
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
BLL	blood lead level
BTEX	benzene, toluene, ethylbenzene, and xylenes
btoc	below top of casing
BTV	background threshold value
Cal EPA	California Environmental Protection Agency
CEM	conceptual exposure model
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CH2M	CH2M HILL, Inc.
COC	chemical of concern
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
CSF	cancer slope factor
CSM	conceptual site model
CVOC	chlorinated volatile organic compound
CWP	Contaminated Waste Processor
DCA	dichloroethane
DCE	dichloroethene
dL	deciliter
DL	detection limit
DNT	dinitrotoluene
DNX	hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine
DO	dissolved oxygen
DoD	United States Department of Defense
DPT	direct-push technology

E&E	Ecology & Environment, Inc.
EBPs	East Burn Pads
EC	exposure concentration
ECEM	Ecological conceptual exposure model
EDA	Explosive Disposal Area
ELCR	excess lifetime cancer risk
EPBs	East Burn Pads
EPC	exposure point concentration
ERA	Ecological Risk Assessment
ERG	Environmental Research Group
ESL	ecological screening level
ESV	ecological screening value
EWI	Explosives Waste Incinerator
FFA	Federal Facility Agreement
FS	Feasibility Study
ft	foot
FTA	Fire Training Area
FTP	Fire Training Pit
FUSRAP	Formerly Utilized Sites Remedial Action Program
GPS	global positioning system
HHEM	*Human Health Evaluation Manual*
HHRA	Human Health Risk Assessment
HI	hazard index
HMX	hot melt explosive (cyclotetramethylene-tetranitramine)
HQ	hazard quotient
IAAAP	Iowa Army Ammunition Plant
IDNR	Iowa Department of Natural Resources
IDW	investigation-derived waste
IRP	Installation Restoration Program
ITR	independent technical review
IUR	inhalation unit risk
JAYCOR	JAYCOR International
K_d	distribution coefficient
kg	kilogram(s)
K_h	Henry's law constant

K_{oc}	carbon partition coefficient
L	liter(s)
Leidos	Leidos, Inc.
LUC	land use control
m	meter(s)
m^3	cubic meter(s)
MC	munitions chemical
MCL	maximum contaminant level
MDC	maximum detected concentration
MEC	munitions and explosives of concern
mg	milligram(s)
mg/kg	milligram(s) per kilogram
mm	millimeter(s)
MMOA	mutagenic mode of action
MMRP	Military Munitions Response Program
MNX	hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine
MRS	Munitions Response Site
MWH	Montgomery Watson Harza
NBPLF	North Burn Pad Landfill
NBPs	North Burn Pads
NBPs	North Burn Pads
NFA	No Further Action
ORP	oxidation-reduction potential
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PAL	project action limit
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
pCi/L	picocuries per liter
PCP	pentachlorophenol
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PPRTV	Provisional Peer-Reviewed Toxicity Value

RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RDX	Royal Demolition Explosive
RfC	reference concentration
RfD	reference dose
RG	remediation goal
RI	Remedial Investigation
RL	reporting limit
ROD	Record of Decision
RSL	Regional Screening Level
SI	site inspection
SL	screening level
SLERA	Screening Level Ecological Risk Assessment
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TCE	trichloroethene
TNT	2,4,6-trinitrotoluene
TNX	hexahydro1,3,5-trinitroso-1,3,5-triazine
UCL	upper confidence limit
UFP-QAPP	Uniform Federal Policy–Quality Assurance Project Plan
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VI	vapor intrusion
VISL	vapor intrusion screening level
VOC	volatile organic compound
VSP	visual sample plan
WBPA	West Burn Pad Area
WBPS	West Burn Pad South of the Road
WBPs	West Burn Pads

SECTION 1

Introduction

This Remedial Investigation (RI) report presents the results of RI activities for the environmental sites within the Explosives Disposal Area (EDA) at the Iowa Army Ammunition Plant (IAAAP), in Middletown, Iowa. IAAAP is an active Joint Munitions Command facility currently operated by civilian contractor American Ordnance, LLC (AO). In accordance with the Federal Facility Agreement (FFA), "Site" refers to the IAAAP and any areas contaminated by the migration of hazardous substances from the IAAAP. The term "site" is used to refer to the environmental solid waste management units and areas of concern at the IAAAP (such as IAAP-012G); this is consistent with Section IX.B of the 2018 Resource Conservation and Recovery Act (RCRA) Permit for the IAAAP.

The EDA is shown on Figure 1-1; the following five areas are included in this OU-10 RI report:

- East Burn Pads (EBPs)
- West Burn Pad Area (WBPA), which includes:
  - Burn Cages site
  - Burn Cage Ash Landfill
  - West Burn Pads (WBPs)
  - WBPs Landfill
  - WBPs munitions response site (MRS)
  - WBPs South of Road (WBPS) MRS
- North Burn Pads (NBPs)
- North Burn Pad Landfill (NBPLF)
- Fire Training Pit (FTP)

The Contaminated Waste Processor (CWP) (IAAP-024) and the Explosives Waste Incinerator (EWI) (IAAP-025) are also located within the EDA, but they are being addressed under the RI reports for OU-12 (CH2M, 2021a) and OU-11 (CH2M, 2021b), respectively. The CWP is being addressed under OU-12 since it is a multi-media (soil and groundwater) site that was previously managed under the Compliance Cleanup (CC) program. The EWI is being addressed under OU-11 since it is a multi-media (soil and groundwater) site that No Further Action (NFA) is warranted.

This OU-10 RI was conducted in accordance with the *Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant, Middletown, Iowa* (UFP-QAPP) (CH2M, 2017a). This work was completed under Delivery Order 0006 of U.S. Army Corps of Engineers, Louisville District (USACE), Contract W912QR-12-D-0005.

1.1 Remedial Investigation Objectives

Several investigations have been conducted at the IAAAP since the 1980s to evaluate the nature and extent of chemicals in site media. The overall objectives of this RI are to update the conceptual site model (CSM) for each site, assess the potential for unacceptable human health risk and hazard and for ecological impacts—that is, identify chemicals of concern (COCs) or chemicals of ecological concern (COECs)—and recommend a path forward consistent with the *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final* (USEPA 1988). To meet the objectives, new and previously collected data (as appropriate) were evaluated to assess the potential for a contaminant release. The data were used to assess the nature and extent of contamination, evaluate chemical fate and transport, and estimate potential risks and hazards posed by site-related contamination to human health and the environment. The Human Health Risk Assessment (HHRA) approach is discussed in Section 4.3.1, and detailed supporting information is included in Appendix A. The Ecological Risk Assessment (ERA) approach is discussed in Section 4.3.2. The updated CSM, which incorporates information onsite characteristics, nature and extent of contamination, fate and transport, the HHRA, and the ERA exposure routes collectively, was used to identify whether a Feasibility Study (FS) or NFA determination is warranted at each site.

1.2 Installation Background

1.2.1 IAAAP Description

The IAAAP consists of 19,011 acres adjacent to Middletown, in Des Moines County, Iowa. It is approximately 8 miles west of Burlington, and with a population of 25,436, is the largest city in Des Moines County. The installation is bordered by Highway 34 to the north, upland agricultural farms to the east and west, and the Skunk River Valley to the south. The installation layout is shown on Figure 1-1.

The IAAAP is an active Joint Munitions Command facility currently operated by civilian contractor American Ordnance, LLC. The current mission of the IAAAP is to load, assemble, and pack ammunition items, including projectiles, mortar rounds, warheads, demolition charges, and munitions components such as fuses, primers, and boosters. Approximately one third of the IAAAP property is occupied by active or formerly active production or storage facilities. The IAAAP consists of production lines, landfills, disposal areas, burn areas, a demolition area, and a fire training area. The remaining land is either woodlands or property leased for agricultural usage. The locations of the IAAAP sites are shown on Figure 1-1.

1.2.2 IAAAP Operational History

The principal mission of IAAAP over time has been to load, assemble, and pack operations for a variety of conventional ammunition and fusing systems. IAAAP was constructed in November 1940, as the Iowa Ordnance Plant and started production in 1941. Production was stopped in 1945, when World War II ended. The plant resumed its ammunition manufacturing mission in 1949, prior to the Korean War. In 1950, in response to the Korean conflict, production increased dramatically. From 1947 through mid-1975, the former Atomic Energy Commission occupied facilities on the site for nuclear weapons and non-nuclear additional weapon-assembly operations; those facilities then reverted to Army control in 1975 (H&S Environmental, 2016).

The IAAAP has a National Pollutant Discharge Elimination System permit (Permit 2900900) in place as part of its operations. In 1995, permitted outfalls were reported at Lines 1, 2, 3, 5, and 800, which discharged to Brush Creek, and at Line 3A, which discharged to the Skunk River. At that time, combined Royal Demolition Explosive (RDX) plus hot melt explosive (HMX) discharge concentrations were as high as 1,410 micrograms per liter (µg/L), and 2,4,6-trinitrotoluene (TNT) discharge concentrations were as high as 2,540 µg/L (JAYCOR 1996).

The 2001 permit allowed discharge of effluent with explosives (TNT and RDX + HMX) from 11 outfalls at the facility. The permit was updated in 2020 and currently allows for seven outfalls to discharge effluent with explosives with a 30-day average of 0.75 milligrams per liter (mg/L) and daily maximum discharge of 2.25 mg/L for RDX + HMX, and with a 30-day average of 0.33 mg/L and daily maximum discharge of 1.00 mg/L for TNT (Figure 1-2). Explosives are not included on the updated permit for five outfalls.

1.2.3 IAAAP Regulatory Setting

Due to explosives-contaminated surface water leaving the installation boundaries, the IAAAP was added to the National Priorities List in August 1990. In September 1990, an FFA was signed by USEPA Region 7 and the U.S. Army; it became effective in December 1990. The 1990 FFA identified 30 RCRA Solid Waste Management Units (SWMUs) at the facility. The 2018 RCRA Permit (USEPA, 2018a) stated that the SWMUs listed in the 1990 FFA are being integrated into the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) sites; the integration plan is currently being developed. Through the FFA, the U.S. Army works with USEPA, with support provided by Iowa Department of Natural Resources (IDNR). The IAAAP was placed under the U.S. Department of Defense (DoD) IRP, which follows the CERCLA process, as amended by the Superfund Amendments and Reauthorization Act.

In July 2002, several areas of the IAAAP previously used by the former Atomic Energy Commission were designated by USACE to be under the Formerly Utilized Sites Remedial Action Program (FUSRAP) and therefore were subsequently removed from the DoD IRP (U.S. Army, 2007). Investigations continued at the FUSRAP areas, and an additional FFA for the FUSRAP sites was finalized in August 2006 (USACE, 2011).

The IAAAP is currently divided into eight operable units (OUs) (USACE, 2016):

- OU-1 (Soils): soil on the IAAAP other than that contaminated by use or testing of military munitions or by radiological chemicals.
- OU-3 (Offsite Groundwater): groundwater outside of the IAAAP boundary.
- OU-4 (Inert Disposal Area): the Inert Disposal Area and its associated landfills, trenches, and sedimentation ponds.
- OU-5 (Military Munitions Response Program): Military Munitions Response Program (MMRP) sites.
- OU-6 (Onsite Groundwater): groundwater within the IAAAP boundary.
- OU-7 (Installation-wide): miscellaneous IAAAP sites not included in the other OUs.
- OU-8 (FUSRAP): sites contaminated by radiological and other contaminants by former Atomic Energy Commission activities and now being addressed under FUSRAP.
- OU-9 (Construction Debris Areas): construction debris disposal sites.

OU-2 was also established originally for soil removal actions but was subsequently merged into OU-1. OU-4 was originally considered the installation-wide OU; however, in October 2009, the previously unaddressed areas of soil contamination were placed in OU-7, and the Inert Disposal Area remained in OU-4 (Tetra Tech, 2011). Because the CC sites were managed under RCRA, they do not currently fall within an OU.

Several of the sites at the IAAAP have been investigated under more than one OU, the FUSRAP, and/or the RCRA CC program. To streamline the CERCLA process, three new OU divisions (OU-10, OU-11, and OU-12) are being proposed based on recommended remedial actions for the IAAAP sites. The OU-10 grouping is proposed for IAAAP groundwater sites in the EDA. The OU-11 grouping is proposed for miscellaneous IAAAP sites that warrant a NFA decision. The OU-12 grouping is proposed for IAAAP sites that were formally managed under the CC program.

1.2.4 IAAAP Sites Included in This Report

The Headquarters Army Environmental System includes 75 IRP sites at the IAAAP. Originally, only the 30 SWMUs that were identified in the FFA were included (IAAP-001 through IAAP-030). The U.S. Army Toxic and Hazardous Material Agency's 1991 draft final *Potential Areas of Concern Supplement* (USATHAMA

1991) designated IAAAP sites IAAP-031 through IAAP-043. Between 1999 and 2003, IAAAP sites IAAP-044 through IAAP-047 were added to address Pinkwater Lagoon, the former fuel station underground storage tanks, off-installation groundwater, and the Central Test Area. In addition, in 2002, nine groundwater-designated sites, or “G” sites, were created to facilitate management of groundwater at areas known to have groundwater contamination. To further separate and manage IAAAP areas by OU, 24 additional IRP sites with a “G” designation were created in the Army database in 2012.

Included in this report are seven IAAAP sites within five areas at the EDA. The sites are listed below with a summary of their Army Environmental Database or RCRA Compliance Cleanup site name and number, a brief description, the OU that the IAAAP site is currently associated with, and the RI report section where the IAAAP site is discussed in more detail.

IAAAP Area (Abbreviation for RI Report)	Army Environmental Database Site Number	Current Operable Unit	Media Addressed in RI Report	Brief Site Description	RI Report Section
East Burn Pads (EBPs)	IAAP-012G	OU-6	Groundwater	Encompasses approximately 12 acres in the northeastern portion of the IAAAP facility and was formerly used for open burning of explosives-contaminated materials.	5.1
West Burn Pad Area (WBPA)	IAAP-032G IAAP-003-R-01 IAAP-005-R-01	OU-6 OU-5	Groundwater Surface Water Sediment	Encompasses approximately 14 acres in the northeastern portion of the IAAAP facility and was formerly used for demilitarization by open burning. Waste materials from burning activities were disposed of at two onsite landfills.	5.2
North Burn Pads (NBPs)	IAAP-036G	OU-6	Groundwater	Encompasses approximately 4 acres in the northeastern portion of the IAAAP facility and was formerly used for open burning of lead azide and gun powder.	5.3
North Burn Pad Landfill (NBPLF)	IAAP-037G	OU-6	Groundwater	Encompasses approximately 10 acres in the northeastern portion of the IAAAP facility and was a former landfill used for disposal of waste materials from burning activities at the NBPs.	5.4
Fire Training Pit (FTP)	IAAP-039G	OU-6	Groundwater	Encompasses approximately 2 acres in the northeastern portion of the IAAAP facility and was formerly used for fire training and to store explosives prior to incineration at the EWI.	5.5

SECTION 2

IAAAP Environmental Setting

2.1 Climate

Des Moines County has a typical Midwestern climate of hot/humid summers and cold/wet winters. According to the National Weather Service (2020), between 1981 and 2010, the mean annual temperature in this area was 53°F. The average annual precipitation in this area is 38.48 inches. During winter, precipitation frequently occurs as snow, and during the rest of the year it is mainly rain, often heavy. The highest rainfall amounts tend to occur between May and August. Snowmelt during spring, combined with frozen or saturated soil conditions that reduce infiltration, can result in high runoff and substantial erosion. In addition, severe thunderstorms in summer can also result in a high volume of precipitation over a short period of time and create high runoff volumes (H&S Environmental, 2016).

2.2 Topography

IAAAP is in the Southern Iowa Drift Plain. The highest elevation in the county, 862 feet above mean sea level (amsl), is located about 13 miles north of IAAAP, near the town of Yarmouth, Iowa. The lowest elevation, about 520 feet amsl, is located where the Skunk River enters the Mississippi River at the southeastern boundary of the county. Vertical reliefs between lowlands and adjoining uplands generally range from 50 to 120 feet.

Where it is not dissected by drainages, the topography at IAAAP is generally flat in the uplands and slopes gently toward the south. Elevations at IAAAP range from 732 feet amsl along the northern extent of the installation to about 544 feet amsl throughout the extensive southern area of Long Creek and Skunk River.

2.3 Surface Water Hydrology

The IAAAP contains five different hydrologic watersheds: Brush Creek, Little Flint Creek, Long Creek, Skunk River, and Spring Creek (Figure 2-1). A watershed is an area of land that drains to a common water outlet, such as a creek or ocean. These four creeks and Skunk River are the common water outlets, or water features to which a watershed drains, present at IAAAP. A watershed includes all the surface water (that is, lakes, reservoirs, and wetlands) within the defined land area. Surface water does not cross watershed boundaries. That is, surface water in drainages in the Brush Creek watershed will not flow into the Long Creek watershed (Figure 2-1). Groundwater in the overburden aquifer (Figure 2-2) and bedrock aquifer (Figure 2-3) are also influenced by the watershed boundaries; however, where the aquifer is deeply confined, groundwater is likely to ultimately discharge to a larger watershed, such as a large river, rather than to a small tributary. At the IAAAP, the Brush Creek and the Long Creek watersheds drain most of the installation.

The five watersheds are summarized as follows:

- The Brush Creek watershed is in the east-central portion of the IAAAP and is fed by intermittent tributaries. Water that drains into Brush Creek flows generally south and exits at the southeastern boundary of the IAAAP. Approximately 3 miles beyond the IAAAP, the creek flows into the Skunk River (Tetra Tech, 2006).
- The Little Flint Creek watershed comprises a very small area in the north-central portion of the facility. Water that drains into this watershed flows northward, away from the installation, before turning south again and joining the Spring Creek watershed (Tetra Tech, 2006).

- The Long Creek watershed is in the west-central portion of the IAAAP and is fed by unnamed perennial tributaries from the north and many small intermittent tributaries (Tetra Tech, 2006). Long Creek has been dammed to form George H. Mathes Lake, within the central area of the IAAAP. Water that drains into Long Creek generally flows east-southeast and south and exits at the southeastern boundary of the installation. Approximately half a mile beyond the IAAAP, the creek flows into the Skunk River (Tetra Tech, 2006).
- The Spring Creek watershed is in the eastern portion of the IAAAP and is fed by perennial tributaries from the north and east and several smaller intermittent tributaries (Tetra Tech, 2006). Water that drains into Spring Creek generally flows south and exits at the southeastern boundary of the IAAAP. The creek eventually discharges into the Mississippi River.
- The Skunk River watershed is in the southwest corner of the IAAAP and is primarily fed by small intermittent tributaries (Tetra Tech, 2006). This watershed drains to Skunk River, which is just outside the southwest boundary of the IAAAP. The river then flows generally east-southeast.

Streamflow can fluctuate over any given year due to many factors. The amount of precipitation varies seasonally, as described in Subsection 2.1. Snow typically stays where it falls, and therefore streamflow may decrease during this period. However, if the ground is frozen when the snow melts, then runoff to the streams may increase temporarily because water cannot infiltrate into the ground. When evapotranspiration is high, as in the early spring or summer, streamflow can decrease because more water is being taken up by plants and released to the atmosphere. Streamflow is also impacted by seasonal fluctuations in the water table elevation of the surficial groundwater aquifer.

The creeks at the IAAAP have been observed to be "gaining" and "losing" streams. A gaining stream is one that gains water from groundwater, typically because the stream channel bottom is lower than the groundwater table. Therefore, groundwater will discharge to the water body. In contrast, a losing stream is one that loses water to groundwater. It is common for a creek to be a gaining stream in one area and a losing stream in another area. Also, creeks and rivers may be gaining at one time of the year and losing in another time of the year.

2.4 Soil

With exception of developing soil associated with rivers and drainages, soil on IAAAP belongs to either the Mollisols or Alfilsols soil orders. Mollisols are a relatively fertile soil and are characterized by a soft surface character, a high base saturation (generally indicative of fertile soil), and a dark color due to abundant humus. Alfilsols are also a relatively fertile soil with moderate to high base saturation. Agriculture plays a major role in Des Moines County, with almost 56 percent of the county designated as prime farmland.

2.5 Geology

IAAAP is in the Dissected Till Plain section of the Central Lowland Physiographic Province of the Southern Iowa Drift Plain Landform Region. The facility is underlain by a sequence of unconsolidated glacial deposits of Pleistocene age (collectively known as overburden) overlying sedimentary bedrock units.

The overburden deposits near IAAAP include alluvium, loess, and glacial drift (including glacial till). The alluvium is composed of alluvial sediment (medium-to-fine-grained sandy silt with varying proportions of gravel) that was deposited in the stream valleys via water flow. Within the IAAAP, alluvium is typically present only near creeks, the Skunk River, and associated tributaries.

Loess, identified as the Peoria Loess near IAAAP, is windblown material composed principally of silt with small amounts of sand and clay and is the basis for the development of fertile soil. The loess was deposited during interglacial periods over the glacial drift. It is found throughout the state, including the plant. The glacial drift consists primarily of silty clay and clayey silt with thin sand seams and lenses and are assigned to the Kellersville Till Member (Illinoian Age) of the Glasford Formation of southeastern Iowa. Figure 2-4 presents a conceptual stratigraphic column for Iowa.

The glacial till extends to depths more than 100 feet below ground surface (bgs) in portions of the northern half of IAAAP, but it is thin or absent locally in deeper stream valleys in the south around Mathes Lake and in the northeast. In general, the glacial till is thicker in the upper reaches, especially in the Brush Creek watershed, and thins to the middle reaches. The till remains relatively constant in thickness in the Long Creek and Spring Creek watersheds.

The bedrock underlying IAAAP consists of a sequence of limestones interbedded with varying thicknesses of shales and sandstones ranging in age from Cambrian to Mississippian. The uppermost rock units within the area are the Warsaw Shale, the Keokuk Limestone, and the Burlington Limestone. There are two basic formations of importance at the facility, which are the uppermost rock units within the area, the Keokuk Limestone and Burlington Limestone of the Osage Series (Mississippian).

Geologic information collected at the individual IAAAP sites is summarized in Section 4. Conceptual cross sections were developed using soil boring log information across the facility. Figures 2-5, 2-6, and 2-7 are simplified geologic cross sections showing the distribution of the geologic layers at IAAAP.

2.6 Hydrogeology and Aquifer Properties

Des Moines County has four principal aquifers: the surficial (overburden) aquifer and the bedrock aquifers of Mississippian, Devonian, and Cambro-Ordovician units. The aquifers of concern for this RI at the IAAAP are the overburden aquifer and the youngest bedrock (Mississippian) aquifer. Figure 2-8 summarizes the hydrogeologic units in Des Moines Iowa. Site-specific discussions of the hydrogeologic aquifers, including depths to groundwater and localized flow patterns, are summarized in Section 4.

Consistent with regional hydrogeologic maps (Coble 1971), the overburden aquifer is composed predominantly of the unconsolidated glacial drift (Kellersville Till) in the upland, northern portion of the IAAAP and of the alluvium within the lower creek and river valleys in the southern portion of the IAAAP (Figure 2-9). The overburden aquifer typically does not include the loess; however, groundwater may exist at the loess–till geologic contact. In these cases, water migrates vertically through the loess. Upon reaching the till, it may “spread” out horizontally within the loess layer, because the permeability of the till is typically much lower than that of the loess. Therefore, vertical flow into the glacial till is restricted. This may also create perched water conditions. Because of the general low permeability of the glacial till, it may act like a confining layer within the surficial aquifer (IDNR, 2003). However, because the till includes beds of sand and gravel, more-permeable zones can be found within the aquifer. These sand beds, which are the result of episodes of meltwater during the glacial periods, are generally thin and discontinuous lenses. In contrast, in areas where the overburden aquifer exists primarily within the alluvium, the aquifer may yield moderate or high volumes of water. These aquifers are generally confined to stream valleys. Groundwater flow direction in the overburden aquifer typically mimics surface topography, with flow in southeasterly or southwesterly toward Brush Creek, Long Creek, Spring Creek, and the Skunk River (Figure 2-2).

Groundwater flow within the bedrock aquifers occurs primarily within secondary permeability zones, including fractures, joints, and bedding planes. Overall flow direction is to the south and east toward the Skunk and Mississippi Rivers, when not intercepted by incised surface drainages (Figure 2-3). The bedrock aquifers are separated by aquicludes, which are low-permeability geologic units that act as confining units and restrict groundwater flow between the aquifers. The Devonian and Cambro-Ordovician bedrock aquifers formations form the principal water-bearing zone near the IAAAP and occur at a depth of approximately 1,500 feet bgs (JAYCOR 1996). Water in these aquifers is reported to be highly mineralized and objectionably hard and contains high amounts of total dissolved solids.

Aquifer hydraulic conductivity (slug) testing has been performed at over 100 wells at the IAAAP, as part of previous investigations conducted between 1981 and 2003. Previous investigations at the individual IAAAP sites are summarized in Section 4. For wells screened in till and till combinations (such as fill and till, loess and till, or alluvium and till), hydraulic conductivity values ranged from 0.00035 foot/day to 4.3 feet/day, with an average of 0.64 foot/day. The higher range of values is indicative of wells screened within sandier layers whereas the lower range of value is indicative of wells screened predominantly within clay. For wells screened in bedrock and bedrock combinations (bedrock and till and bedrock and till/glacial outwash), hydraulic conductivity values ranged from 0.00015 foot/day to 51 feet/day, with an average of 2.3 feet/day. Slug test results are generally considered to represent an order-of-magnitude level of precision and accuracy in estimating horizontal hydraulic conductivity.

In areas where the overburden aquifer exists primarily within the glacial till, the aquifer typically has a very low yield (less than 10 gallons per minute; Figure 2-8). In comparison, aquifer yields within alluvium aquifers may yield 25 to 100 gallons per minute.

2.7 Ecology

Wildlife found in available habitats at IAAAP includes a large white-tail deer population, fox, gray squirrel, raccoon, woodchuck, coyote, eastern cottontail rabbit, mouse, mole, pocket gopher, beaver, muskrat, badger, opossum, and mink. To effectively manage the overpopulation of deer, limited recreational hunting has been allowed onsite. Recreational trapping of fur-bearing mammals is also allowed during limited times of the year (USACE, 2019).

Numerous bird species inhabit or migrate through the IAAAP. Some of the most common species include the American robin, northern cardinal, blue jay, red-headed woodpecker, common crow, common grackle, mourning dove, red-winged blackbird, chipping sparrow, eastern meadowlark, American goldfinch, and turkey. The red-headed woodpecker is protected under the Migratory Bird Treaty Act of 1918 (16 U.S. Code 703-712), which is administered by the U.S. Fish and Wildlife Service. Red-tailed hawks are the most common raptor species present, but bald eagles have been observed flying over the IAAAP or feeding on the fish they catch in Mathes Lake (H&S Environmental, 2016).

The U.S. Fish and Wildlife Service provided maintenance stocking of walleye and striped bass hybrids in Mathes Lake to predate on the abundant gizzard shad (*Dorosoma cepedianum*). Channel catfish are generally stocked in new impoundments or to supplement natural reproduction. Some natural channel catfish reproduction in Mathes Lake has been noted (H&S Environmental, 2016).

Federally listed threatened or endangered species that have been recorded on the IAAAP property include the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*). The northern long-eared bat is listed as threatened throughout the State of Iowa (USFWS, 2018a). The Indiana bat is listed as endangered in a number of counties in Iowa including Des Moines. Based on information presented by the U.S. Fish and Wildlife Service (USFWS) (USFWS, 2018b), these species are fairly similar in ecology and life history. For example, USFWS (USFWS, 2018b) notes that “the northern long-eared bat and Indiana bat are both temperate, insectivorous, migratory bats that hibernate in mines and caves in the winter and spend summers in wooded areas.” Both species typically hibernate mid-fall through mid-spring each year. Suitable summer habitats for both species include a wide variety of forested/wooded habitats where they roost, forage, and travel. Some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures could occur in the forested habitats. The main habitat difference between the two bats appears to be that northern long-eared bats are typically associated with upland forests with generally more canopy cover than Indiana bats. They prefer upland, mature forests (Caceres and Pybus, 1998) with occasional foraging over forest clearings, water, and along roads (Jong, 1985). However, most foraging occurs on forested hillsides and ridges, rather than along riparian areas preferred by the Indiana bat (Brack and Whitaker, 2001; LaVal et al., 1977).

In 1999, a National Wetlands Inventory was conducted on the installation by the U.S. Fish and Wildlife Service. Based on the inventory, IAAAP contains 113.2 acres of wetland. Forested wetlands are the dominant type, representing about 50 percent of the installation's wetlands. The next most common type is unconsolidated bottoms ("ponds"), which comprise about 24 percent of the wetlands. IAAAP contains 57.3 miles of linear wetlands including rivers and streams (3.1 miles of wetlands and 54.2 miles of rivers and streams). Wetland acreages are as follows: Emergent Wetland—14.7 acres; Scrub/Shrub Wetland (Broadleaved Deciduous)—10.8 acres; Forested Wetland—60.2 acres (Temporarily Flooded—56.5 acres and Seasonally Flooded—3.7 acres); and Unconsolidated Bottom—27.5 acres (H&S Environmental, 2016).

2.8 Land and Resource Use

The current mission of the IAAAP is to load, assemble, and pack ammunition items. Public access to the installation is restricted by perimeter fencing and the IAAAP installation security staff. Approximately 8,000 acres of the IAAAP are leased for agricultural use, 7,500 acres are forested, and the remaining areas are used for administrative and industrial operations (USACE, 2016). Recreational facilities are located on the IAAAP property and in the area immediately surrounding the IAAAP. Hunting and fishing are regulated at the IAAAP using permits. There is also a boat ramp on the eastern shore of Mathes Lake. Currently, portions of Mathes Lake are used for recreational purposes by employees and the public.

Future residential use is not anticipated for IAAAP. The anticipated future land use at the IAAAP is commercial, industrial, agricultural, and recreational (USACE and Dawson, 2021). The final *Explanation of Significant Differences for the Records of Decision Soils Operable Unit 1 (OU-1)* (Leidos, 2018) establishes the requirements for land use controls (LUCs) for OU-1 areas and the excavation areas associated with the non-time-critical sump removal actions. LUCs will include (Leidos 2018):

> prohibitions on land use (e.g., through incorporation of a formal institutional control) to maintain commercial/industrial (i.e., nonresidential), to prohibit residential land use, and to prohibit the development and use of the property for elementary and secondary schools, childcare facilities and playgrounds.

Per the Record of Decision (ROD) for OU-5 (CB&I, 2014), LUCs have also been established as the remedy for Military Munitions Response Program areas. The LUCs for OU-5 consist of access restrictions (such as fencing and signage).

The land surrounding the IAAAP is characterized as rural and is expected to remain rural (USACE, 2016). The largest population centers are the towns of Burlington, West Burlington, Middletown, and Danville (U.S. Census Bureau, 2010). Near OU-3, the land use is predominantly rural, residential, and agricultural, and used mostly for corn and soybean production (USACE, 2016). Some of the farmland is reclaimed floodplain, meaning it has been elevated with drain tiles to control the water table. Some of the floodplain is owned by a commercial sand and gravel quarry which has recently expanded their land holdings into the contaminant plume extent. Other than the extension westward of the quarry, no significant change in future land use is known or anticipated (USACE, 2016). In 1994, all residences south of the IAAAP, east of an unnamed tributary of Skunk River that flows from the Line 3A area, and west of Spring Creek were offered connection to the Rathbun public water supply. Most of the residences were connected to the Rathbun public water supply as authorized by the 1993 Action Memorandum (Department of the Army, 1993); however, some residences declined or did not respond to the Army's 1993 offer. Groundwater is used for residential potable supply except where connections to the Rathbun Regional Water Supply have been made. Groundwater in this off-facility area is addressed under the OU-3 remedy.

Since 1977, IAAAP has received potable drinking water on a fee basis from the Burlington Regional Water Works in the town of Burlington. Burlington's water source is the Mississippi River. The

Burlington Regional Water Works pumps water from their treatment plant to the City of Burlington's distribution center. Groundwater use on the installation has been discontinued, and known production wells have been closed, including four deep groundwater wells that were closed in the early to mid-1990s. There are two exceptions: F-Yard Well #500-165-6, where groundwater from the IAAAP is used in cyclic heating of poured ammunition rounds, and D-Yard Well #500-165-5, from which groundwater supplies the restroom at Yard D (Busard, pers. comm., 2019).

SECTION 3

RI Field Investigation Activities

This section describes the methodology of the field investigation activities conducted as part of the current RI at IAAAP for the sites included in this report. Field activities were performed at the EDA from 2018 through 2020 to address data gaps identified in the final UFP-QAPP, which hindered completion of the RI at these IAAAP sites. Fieldwork was completed in accordance with the final site-specific worksheets of the UFP-QAPP (CH2M, 2018a). Previous investigations for these IAAAP sites are described in Section 5.

The field activities conducted during this RI consisted of the following activities:

- Site preparation/mobilization.
- Utility clearance.
- Monitoring well installation and development.
- Groundwater and surface water sampling.
- Surveying.
- Decontamination.
- Waste management.
- Data management.

Samples collected during the RI field investigation were submitted to preapproved, offsite laboratories (Test America Laboratory in Arvada, Colorado; Savanna, Georgia; and St. Louis, Missouri; and Eurofins Laboratory in Lancaster, Pennsylvania).

This section provides an overview of the RI field activities. Section 5 provides specific investigation objectives and RI field investigations for individual IAAAP sites. Appendix B contains laboratory reports and the data quality evaluation. Appendix C contains the field documentation, Appendix D contains the waste management documentation, and Appendix E contains the survey data as applicable to the 2018–2020 RI monitoring well installation activities.

3.1 Site Preparation/Mobilization

3.1.1 Permits/Base Access

Fieldwork was coordinated with USACE and appropriate installation points of contact, including AO, the onsite contractor at the IAAAP. Work clearances and permits were obtained for all field activities. Laydown areas for equipment storage and staging were made available and determined through coordination with AO points of contact.

CH2M team field personnel obtained construction identification badges from AO Security prior to conducting field activities. CH2M team personnel obtained camera passes from AO Security. Well keys were signed out and returned daily at AO Security.

3.1.2 Biological/Ecological Survey

Prior to intrusive activities and any vegetation removal, an IDNR-approved biologist walked each of these sites to inspect and eliminate potential impacts to federally protected species, including the Indiana bat (*Myotis sodalist).* All intrusive work was coordinated with base Natural Resources manager and conducted within permitted months.

3.1.3 Vegetation Removal

Because many of the proposed sampling locations were in heavily vegetated areas, clearance was required to allow site access. Vegetation clearance was performed by Allworth Contracting (Allworth) or PARS using both mechanical and manual methods. Allworth or PARS field personnel cut vegetation consisting of grass, shrubs, brush, and small trees. The paths and work areas were maintained, as needed, by PARS for the duration of the investigation.

3.1.4 Utility Survey

Prior to the start of any intrusive work, CH2M identified and marked sampling locations and coordinated activities with the AO representatives. In addition, the Underground Detective was contracted by CH2M to perform third-party utility location activities at offsite locations. AO completed third-party utility clearance prior to all intrusive activities at the IAAAP.

In addition to the utility location activities, all proposed intrusive drilling locations were cleared to check for buried utilities using hand augers to a depth of at least 5 feet bgs.

3.2 RI Investigation Methods

Additional field work was conducted at the IAAAP sites below to resolve data gaps needed to complete the RI, per the final UFP-QAPP. The following field activities were conducted in 2018 through 2020:

- EBPs—monitoring well installation, well development, groundwater sampling, water level gauging, surveying, and waste management
- WBPA—monitoring well installation, well development, groundwater sampling, surface water sampling, staff gauge installation, water level gauging, surveying, and waste management
- NBP—monitoring well installation, well development, groundwater sampling, water level gauging, surveying, and waste management
- NBPLF—monitoring well installation, well development, groundwater sampling, water level gauging, surveying, and waste management
- FTP—groundwater sampling, water level gauging, surveying, and waste management

This section describes the field methods that were implemented. Site-specific details, including the selected sampling or well installation methods, are provided in Section 5.

3.2.1 Permanent Monitoring Well Installation

The permanent monitoring wells were installed in accordance with the final UFP-QAPP (CH2M, 2017a) using direct-push technology (DPT), hollow-stem auger, downhole hammer, or rotosonic drilling methods. During drilling, continuous soil samples were collected to log the soil lithology. Grain size, color, moisture content, consistency, and other observations such as evidence of contamination were recorded. Appendix C contains the soil boring logs.

New monitoring wells were constructed with a 2-inch-inside-diameter Schedule 40 PVC screen and a riser with a 0.010-inch slot size screen. A silica sand filter pack was placed around the annular space of the well screen from the bottom of the boring and well screen to a depth of about 2 feet above the top of the screen. A bentonite layer roughly 2 feet thick was placed at the top of the sand pack. After the bentonite was allowed to hydrate, a cement-bentonite grout was placed in the remaining annular space to the surface. The monitoring wells were completed flush to ground surface with a traffic-rated, watertight, steel vault and locking watertight cap. Appendix C contains the well construction diagrams.

See Section 5 for details on permanent monitoring wells installed at the IAAAP sites in this RI report.

3.2.2 Monitoring Well Development

New monitoring wells were developed at least 24 hours after installation was completed to remove fine-grained sediment generated during construction. Monitoring wells were developed by a combination of bailing, surging, and pumping. Well development continued until water quality parameter readings stabilized with three consecutive readings, in accordance with the final UFP-QAPP (CH2M, 2017a), unless otherwise mentioned in Section 5. Well development information, including water quality data and the volume of groundwater removed, was recorded on a well development log or in the field logbook. Appendix C contains the well development logs. See Section 5 for details on well development activities at the IAAAP sites in this RI report.

3.2.3 Water Level Survey

Manual groundwater elevation measurements were obtained from monitoring wells using an electronic water level meter with 0.01-foot graduations. The depth to water in each well was measured from a designated point on top of the well casing.

3.2.4 Groundwater Sampling

Groundwater samples were collected from DPT locations, temporary monitoring wells, and permanent monitoring wells at the IAAAP sites. Groundwater samples were collected using a peristaltic pump and disposable tubing from DPT locations or wells with depths to water of less than 30 feet bgs. In wells with depths to water greater than 30 feet, a submersible bladder pump was used to collect samples. Groundwater quality parameters (pH, specific conductance, turbidity, dissolved oxygen, temperature, salinity, and oxidation-reduction potential) were collected using a water quality meter and were recorded on purge logs. Groundwater quality parameters were allowed to stabilize for three consecutive readings before each well was sampled.

Groundwater samples were collected in laboratory-prepared sampling containers that were pre-preserved based on the analytical method and submitted to Test America or Eurofins. See Section 5 for details on monitoring well sampling at the IAAAP sites in this RI report.

3.2.5 Surface Water Gauging

New staff gauges were installed at Spring Creek to evaluate surface water–groundwater interaction. The staff gauges were installed at accessible locations of Spring Creek. Gauge stations consisted of a metered vertical panel and were fixed in place by driving rods into the subsurface. Once installed, staff gauges were surveyed in place. See Section 5.2 for details on surface water gauging at the IAAAP sites in this RI report.

3.2.6 Surface Water Sampling

Surface water samples were collected from Spring Creek and onsite tributaries. Surface water samples were collected by direct grab or via a sample transfer device (for example, a peristaltic pump), depending on location accessibility. Surface water samples were collected in laboratory-prepared sampling containers that were pre-preserved based on the analytical method and submitted to Test America or Eurofins. See Section 5.2 for details on surface water sampling at the IAAAP sites in this RI report.

3.2.7 Surveying

New monitoring wells and staff gauges were surveyed by State of Iowa–licensed professional surveyor Bruner, Cooper & Zuck. The surveyors set up horizontal and vertical control for the site. Accuracy of the control was held to the Third Order Class I as outlined in the *Geospatial Positioning Accuracy Standards,* *Part 4: Standards for Architecture, Engineering, Constructions (A/E/C) and Facility Management* (Federal Geographic Data Committee, 2002).

The surveyor provided coordinates of the points *x*, *y*, and *z* to the nearest 0.01 foot. Horizontal coordinates conformed to North American Datum (NAD) 83 and the vertical elevations were referenced to National Geodetic Vertical Datum (NAVD) 88 with ties to the Iowa State Plane Coordinate System. Appendix E contains the survey report.

Soil borings and temporary well locations were surveyed using a global positioning system (GPS). Locations of new soil borings were determined using real-time kinematic GPS coordinates, with GPS accuracy dependent on site-specific conditions such as canopy cover.

3.2.8 Decontamination and Waste Management

Decontamination and waste management activities were conducted in accordance with the final *Basewide Environmental and Waste Management Plan* (CH2M, 2018b). Investigation-derived waste (IDW) generated during the RI included drill cuttings from the soil borings and monitoring well installations, well development and purge water, and decontamination fluids used to decontaminate nondisposable sampling equipment. New, United Nations–approved 55-gallon steel drums were used to contain waste generated during the field activities.

Groundwater generated during well development was temporarily stored in labeled drums or portable tanks. Groundwater was disposed of at the onsite Inert Disposal Area groundwater treatment facility with approval from IAAAP.

Downhole and nondisposable sampling equipment was decontaminated immediately after each use. Water generated during decontamination of sampling equipment was collected and transferred to an onsite groundwater treatment facility. Reusable heavy equipment, such as drilling rods and augers, was decontaminated before and in between the collection of each sample using a high-pressure steam cleaner with potable-grade water. Pressure washing was conducted at temporary decontamination pads. Decontamination fluids were captured and containerized for disposal at the onsite groundwater treatment facility.

IDW was temporarily stored at the installation approved staging location and properly labeled. The soil drums were sampled by CH2M for waste characterization. Based on the analytical results, IDW was classified as nonhazardous and disposed of at the Des Moines County Regional Landfill in West Burlington, Iowa, and the Clean Harbors facility in Cincinnati, Ohio. Appendix D contains the final executed manifests.

3.3 Data Management and Evaluation

3.3.1 Data Tracking

Data management and tracking was conducted from the time of field collection to receipt of validated electronic analytical results. Field samples and their corresponding analytical tests were recorded on the chain-of-custody forms submitted with the samples to the laboratory. Chain-of-custody entries were checked against the site-specific project instructions and work plans to verify that the designated field samples had been collected and submitted for the appropriate analysis. Upon receipt of the samples by the laboratories, a comparison to the field information was conducted to verify that each sample was analyzed for the correct parameters, and appropriate quality assurance/quality control samples were collected.

3.3.2 Data Quality Assessment

CH2M performed a data review and verification as described in the UFP-QAPP (CH2M, 2017a). The data quality of analytical results from the samples collected during the field investigation was assessed.

Analytical data were validated as Stage 2B level evaluations. Qualifier flags were applied to the data to reflect data usability limitations. The data review and verification efforts are documented in the data quality evaluation report (Appendix B).

The results are usable for project objectives, unless otherwise detailed in Appendix B. Based on the verification effort, the data appear to accurately represent the conditions of the environmental media analyzed at the time of collection, as detailed in Section 5. The analytical techniques were properly performed and documented, and the laboratory procedures applicable to each method were followed and documented. Standard industry laboratory methods were used to analyze the data as prescribed in the approved UFP-QAPP (CH2M, 2017a). Summary tables of the reported data, including both detections and nondetects, are included in Section 5.

3.4 Deviations

Deviations from the final UFP-QAPP and site-specific worksheets are site-dependent and are therefore discussed in Section 5.

SECTION 4

Approach for RI Data Evaluation

Data from previous investigations were used to assess the nature and extent of contamination and evaluate for potential site-related impacts. This section describes the approaches used for the RI data evaluation for the IAAAP sites.

4.1 Nature and Extent Approach

4.1.1 Site Characterization Project Action Limits

In accordance with the final UFP-QAPP (CH2M, 2017a), screening values used for site characterization differ from those used to select chemicals of potential concern (COPCs) in the risk assessments. The site characterization screening levels (SLs) were used to assess the distribution and nature and extent of chemicals whereas more conservative screening values were used for risk assessment (see Section 4.3.2). The final selected project action limit objectives are summarized in Appendix F.

For site characterization, chemical concentrations were compared with project action limits (PALs) listed in the final UFP-QAPP (CH2M, 2017). The PALs considered for the IAAAP sites included in this report are summarized below:

- Soil based on human health:
  - USEPA Regional Screening Level (RSL) for residential soil (hazard quotient [HQ] = 1), May 2023 (USEPA, 2023a).
- Soil based on ecological goals:
  - USEPA Region 4 Ecological Screening Values (EVS) (USEPA, 2018b).
  - USEPA Region 5 Ecological Screening Levels for Soil (USEPA, 2003a).
- Groundwater based on human health (maximum contaminant level, or MCL, to be used; if no MCL is available, the greater of the Health Advisory Level and the RSL):
  - Federal MCL, March 2018 (USEPA, 2018c).
  - USEPA RSL for tap water (HQ = 1), May 2023 (USEPA, 2023a).
  - Health Advisory Level (lifetime), March 2018 (USEPA, 2018c).
- Sediment based on human health:
  - HHRA sediment RSL (HQ=1) for a recreational scenario (USEPA, 2023a).
- Sediment based on ecological goals (listed in the order of selection):
  - USEPA Region 4 Ecological Screening Values (ESVs) (USEPA, 2018b).
  - USEPA Region 5 Ecological Screening Levels for Sediment, August 2003 (USEPA, 2003a).
  - USEPA Region 3 Biological Technical Assistance Group for Freshwater Sediment, August 2006 (USEPA, 2006).
- Surface water based on human health (lowest of the two objectives):
  - Iowa Ambient Water Quality Criteria Standard, Fish Consumption, Iowa Administrative Code, Chapter 61 (2019).

  - HHRA Surface Water RSL (HQ=1) for a recreational scenario (USEPA, 2023a).
- Surface water based on ecological goals (listed in the order of selection):
  - Iowa Ambient Water Quality Criteria Chronic, IAC Chapter 61 (2019).
  - USEPA National Recommended Water Quality Criteria—Aquatic Life Criteria Table (USEPA, 2020a).
  - USEPA Region 4 ESVs (USEPA, 2018b).
  - USEPA Region 5 Ecological Screening Levels for Surface Water, August 2003 (USEPA, 2003a).
  - USEPA Region 3 Biological Technical Assistance Group for Freshwater, July 2006 (USEPA, 2006).

4.1.2 Background Threshold Values

USEPA's (2002) *Role of Background in the CERCLA Cleanup Program* guidance states that risk management and remedial actions for CERCLA sites should account for the influence of natural and anthropogenic background conditions, and that cleanup goals for chemicals of concern from an identified CERCLA release should not be set below their corresponding background concentrations. Background concentrations for natural and anthropogenic chemicals are also used for comparison to site data to support the identifications of a site-related release.

Accordingly, analytical data were compared to the background values calculated for the IAAAP to assess whether the detected concentrations were consistent with the background concentrations for metals; site-specific discussions are included in Section 5. Background threshold values (BTVs) were calculated for groundwater at IAAAP and documented in the final *Evaluation of Background Concentrations of Metals in Groundwater* (CH2M, 2020a). BTVs were also developed for sediment and surface water specific to three of the watersheds at IAAAP: Brush Creek, Long Creek, and Spring Creek. BTV calculations are documented in the draft *Evaluation of Background Concentrations of Metals in Sediment and Surface Water* (CH2M, 2020b). Background values were established for soil as part of the *Reevaluation of Background Concentrations of Metals in Soil* (Jacobs, 2022).

BTVs are presented in the site-specific screening tables in Section 5 of this report.

4.2 Chemical Fate and Transport Overview

The properties of chemicals and the environment are used to understand and predict chemical fate and transport. An understanding of the fate and transport is part of the overall assessment of the potential for a chemical to cause an adverse human health or environmental effect. This section provides an overview of the fate and transport properties of chemicals previously identified as COPCs at IAAAP. Site-specific discussions are included in Section 5.

Based on previous investigations at IAAAP, the main COPCs that occur at the IAAAP sites are in five contaminant classes: explosives, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals. Semivolatile organic compounds (SVOCs) other than the PAHs were rarely considered to be site-related, and pesticides were detected infrequently.

4.2.1 Chemical Mobility and Persistence

The mobility and persistence of potential contaminants are determined by their physical, chemical, and biological interaction with the environment. Mobility is the potential for a chemical to migrate from a site, and persistence is a measure of how long a chemical will remain in the environment. Some of the mechanisms controlling mobility and persistence are described as follows:

- *Volatilization* occurs when a compound transfers from the aqueous phase to the gas phase. Measures of a chemical's tendency to volatilize from water and soil moisture include its vapor pressure and Henry's law constant (K_h). Volatilization tends to occur more readily from surface water, sediment, or shallow soil than from deeper soil or groundwater.
- *Sorption* occurs when a constituent adheres to and becomes associated with solid particles. The soil and sediment media likely to sorb chemicals are clays and organic matter. The conventional measure of sorption is the distribution coefficient (K_d). The K_d for organic chemicals is typically the product of the soil organic carbon partition coefficient (K_{oc}) of the chemical and the fraction of organic carbon in the soil. Metals sorption potential is a complex function of pH, organic content, oxide coatings, and other factors; therefore, K_d is not easily estimated by methods other than site-specific testing (USEPA 1996). Generally, metals adsorption increases with pH and they most often sorb to clay minerals, organic matter, and iron and manganese oxyhydroxides.
- *Solubility* is a measure of the degree to which a constituent will dissolve in water. Highly soluble chemicals are more likely to be leached from soil by precipitation or runoff that infiltrates into the subsurface.
- *Degradation* is the deterioration or destruction of a chemical, either biologically (through biodegradation) or abiotically (through such processes as abiotic reduction, hydrolysis, and photolysis). Biodegradation of chemicals by microbial organisms occurs through metabolic or enzymatic processes. The rate of degradation is dependent on the chemical, biological, and physical conditions of the medium in which the contaminant is located.
- *Transformation* occurs when the valence state of metals is increased (oxidation) or decreased (reduction). It can be caused by changes in oxidation potential or pH and by microbial or nonmicrobial (abiotic) processes. Transformation may have a significant effect on the mobility of a metal, either increasing or decreasing it.

Physical and chemical properties for the primary COPCs identified at the IAAAP are summarized in Table 4.2-1; information provided in Table 4.2-1 supports fate and transport discussions in the site-specific sections of this report as well as risk assessment calculations, which utilize values presented on the USEPA risk assessment website (USEPA, 2022a).

4.2.1.1 Explosives

The explosives at the IAAAP are characterized by limited volatility, moderate solubility, and low sorption potential (U.S. National Library of Medicine, 2015). The explosives are subject to biodegradation; however, degradation occurs under varying mechanisms. RDX, which is the most prevalent explosive at the IAAAP, most favorably degrades under anaerobic conditions (Pennington et al., 1999) in which it is reductively degraded to hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX), then hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX), and subsequently to hexahydro1,3,5-trinitroso-1,3,5-triazine (TNX). Other intermediates may also be formed, such as formaldehyde, methanol, hydrazine, 1,1-dimethylhydrazine, and 1,2-dimethylhydrazine (Battelle, 2015). RDX is also subject to abiotic degradation and can be transformed to methylene dinitramine. However, it will not be completely degraded to carbon dioxide via this mechanism alone.

In comparison, TNT can be aerobically biodegraded, reduced by hydrogen under anaerobic conditions, or degraded by biotic cometabolism. TNT can be also degraded abiotically by hydrolysis or reduced by iron. Amino-dinitrotoluenes (DNTs) are intermediate transformation products of TNT reduction under oxic or anoxic conditions (Battelle, 2015). 4-Amino-2,6-dinitrotoluene is also a daughter product of the abiotic transformation of TNT.

HMX can be biodegraded under anaerobic conditions, most favorably under sulfate-reducing conditions. It will degrade to methane and chloroform under anaerobic conditions when a mixed microbial consortium is present (Battelle, 2015).

2,4-DNT and 2,6-DNT can be biodegraded under aerobic and anaerobic conditions. However, 2,4-DNT can be resistant to aerobic biodegradation under certain conditions (ATSDR, 2013). The DNTs can be used as the sole energy source or degraded via cometabolism with ethanol, methanol, and acetic acid. Potential aerobic degradation products include amino-nitrotoluene isomers, carbon dioxide, nitrite, or nitrate. Nitrite can inhibit further 2,6-DNT degradation. Anaerobic degradation can also result in diaminotoluenes. 2,4-DNT and 2,6-DNT are subject to abiotic degradation via photolysis, ozonation and chlorination, or oxidation by strong oxidants. The presence of the amino-DNT isomers (such as, 4-amino-2,6-DNT) in groundwater may be byproducts of anaerobic biodegradation of 2,6-DNT. These amino-DNTs can be further degraded to nitrotoluenes (McFarlan, 1998).

4.2.1.2 Volatile Organic Compounds

VOCs detected at the IAAAP include chlorinated volatile organic compounds (CVOCs); benzene, toluene, ethylbenzene, and xylenes (BTEX); and Freon 113. The K_h values for VOCs indicate that they are expected to volatilize quickly from surficial soil and surface water (U.S. National Library of Medicine 2015). The VOCs are also characterized by relatively high solubilities and low sorption potential. CVOCs are subject to degradation by biological and abiotic mechanisms. Under anaerobic conditions, biodegradation typically occurs by reductive dechlorination, a naturally occurring process in which chlorine atoms on a parent CVOC molecule are sequentially replaced with hydrogen. Some CVOCs can be aerobically biodegraded via aerobic cometabolism to carbon dioxide. They are also subject to abiotic degradation, mainly mediated by iron-bearing minerals in the subsurface under reducing conditions. Aromatic VOCs, such as BTEX, can be biodegraded in oxidation-reduction reactions, in which the contaminant is used as the electron donor by the microorganism. Biodegradation will occur when enough electron acceptors, electron donors, and nutrients are available in groundwater. Freon 113 has been observed to undergo biodegradation under anaerobic and aerobic conditions; however, the degradation rate may be slow, and the contaminant may be persistent (U.S. National Library of Medicine, 2015).

4.2.1.3 Polycyclic Aromatic Hydrocarbons

PAHs are a group of organic compounds consisting of two or more rings comprising six carbon atoms. The number of rings significantly affects the properties of the molecule. High-molecular-weight PAHs, such as benzo(a)pyrene, generally have limited volatility, very low water solubility, and high sorption potential. On the contrary, low-molecular-weight PAHs, such as naphthalene, have moderate volatility, moderate water solubility, and moderate sorption potential (U.S. National Library of Medicine 2015). Therefore, naphthalene has greater mobility than high-molecular-weight PAHs.

PAHs can be biodegraded under aerobic and anaerobic conditions (U.S. National Library of Medicine, 2015). However, aerobic biodegradation occurs at a much faster rate. The principal mechanism for aerobic metabolism is the initial oxidation of the benzene ring by the action of oxygenases. Nevertheless, PAHs sorbed to organic matter may be less available for biodegradation. In general, high-molecular-weight PAHs are more recalcitrant than low-molecular-weight PAHs and as a result have longer half-lives.

4.2.1.4 Pentachlorophenol

Pentachlorophenol (PCP) has been observed to degrade anaerobically by reductive dechlorination. To complete anaerobic degradation, each chlorine molecule acts as an electron acceptor and is replaced by hydrogen, producing first tetrachlorophenol, then trichlorophenol, dichlorophenol, chlorophenol, and finally phenol before the aromatic ring is broken relatively late in the process. Possible intermediate breakdown products include three isomers of tetrachlorophenol, five isomers of trichlorophenol, six isomers of dichlorophenol, and three isomers of chlorophenol. The pathway that is followed at a specific site appears to depend on the type of microorganism present in the system (Mahaffey, 1997). For anaerobic degradation of PCP to occur, highly anaerobic conditions must exist in the aquifer; dissolved oxygen levels below 0.5 mg/L are necessary in the groundwater.

In the aerobic degradation of PCP, the phenol ring is broken during an early stage of the process and complete mineralization to carbon dioxide, water and chloride occurs much more quickly than through the anaerobic pathway. Initial intermediate products that form prior to breaking the phenol ring may include tetrachloroatechol, tetrachlorohydroquinone, tetrachlorobenzoquinone, trichlorohydroxylbenzoquinone, tert-butylhydroquinone, dichlorohydroquinone, and chlorohydroquinone (Mahaffey, 1997). For aerobic oxidation to occur, a dissolved oxygen concentration in the groundwater of at least 2 mg/L is typically required.

4.2.1.5 Polychlorinated Biphenyls

The most common PCBs detected at IAAAP were Aroclor 1254 and Aroclor 1260. These chemicals are relatively immobile in the environment and are persistent. PCBs have moderate volatility, high sorption potential, and low water solubility. Higher-weight PCBs (such as Aroclors 1254 and 1260) are resistant to aerobic biodegradation (U.S. National Library of Medicine, 2015). Anaerobic reductive dechlorination of these PCBs can occur but may require enhancement to achieve effective degradation rates. These PCBs do not significantly degrade abiotically in the environment.

4.2.1.6 Metals

Due to the complexity of metals and their variable forms in the environment, predicting their chemical mobility and persistence can be difficult. Typically, they are not volatile under normal temperature and pressure conditions. Their sorption potential is a complex function of pH, organic content, oxide coatings, and other factors; therefore, K_d is not easily estimated by methods other than site-specific testing (USEPA, 1996). Generally, metal adsorption increases with pH. Metals most often sorb to clay minerals, organic matter, and iron and manganese oxyhydroxides. Metals may be sorbed on the surface of the soil or fixed to the interior of the soil, where they are unavailable for release to groundwater. After available sorption sites are filled, most metals are incorporated into the structures of major mineral precipitates as coprecipitates (ERG, 2005).

The solubilities of metals are also dependent on several factors. In general, solubility is highly dependent on the oxidation state of the metal (USEPA, 2007). The solubility of cations (positively charged ions) decreases as pH increases. Some cations may complex with oxygen and hydroxide, forming insoluble oxyhydroxides, or with phosphate, sulfate, and carbonate, forming insoluble mineral precipitates. Metal sulfide complexes, which form in reducing environments, are extremely insoluble and tend to reduce the total metals concentrations (ERG, 2005).

The solid forms of iron (iron hydroxides) and manganese (manganese oxides) are present in the natural soil matrix. If insufficient amounts of oxygen and nitrate are present in the subsurface, then iron hydroxides and manganese oxides will be used as electron acceptors during metabolic activity and dissolve under reducing conditions into soluble forms. Sulfides present in groundwater can also result in the dissolution of iron hydroxides. Several metals (such as arsenic) tend to sorb to these iron hydroxides and manganese oxides. If these iron and manganese compounds are dissolved, the metals that are bound to these hydroxides and oxides (such as chromium and arsenic) will also be released. Iron also becomes more soluble as pH drops below 7 (ERG, 2005).

Subsurface conditions are likely to become more reduced in areas that have substantial carbon available. Several metabolic processes can use naturally occurring organic carbon or anthropogenic organic compound contamination as an electron donor or electron acceptor. Metal concentrations, in particular iron and manganese and those metals that tend to desorb from iron and manganese oxyhydroxides when they are reduced to their more soluble forms, are also frequently higher in areas of organic contamination (such as explosives or VOC plumes) because of the reducing conditions that are created during biodegradation of these chemicals (USEPA, 2017a).

4.2.2 Chemical Transport

Contamination at the IAAAP is attributed primarily to historical load, assembly, and pack operations for ammunitions. In particular, there appear to be several contaminant plumes emanating from wastewater treatment buildings along the production lines. Sources of contamination at the individual sites are discussed in Section 5.

Figure 2-9 depicts the CSM for the IAAAP and supports the fate and transport discussion. It qualitatively combines and interprets physical characteristics and the nature and extent of contamination. Primary migration pathways for potential contaminants at IAAAP include the following:

- Volatilization of contaminants in surface soil and surface water.
- Volatilization of contaminants in subsurface soil and shallow groundwater due to construction/ excavation activities.
- Volatilization of contaminants into unsaturated zone soil gas at the water table interface.
- Transport of contaminants sorbed to soil via historical wastewater discharge, stormwater runoff/ erosion, and wind erosion to drainage ditches.
- Leaching of contaminants in soil to groundwater.
- Advection of dissolved contaminants with groundwater flow.
- Discharge of contaminants in groundwater through sediment and into surface water.
- Surface water transport of chemicals within drainage ditches and creeks.

Migration pathways for potential contaminants at IAAAP are further discussed below in the context of their location (i.e., unsaturated zone, surface water, sediment, stormwater, and saturated zone migrations).

4.2.2.1 Unsaturated Zone Migration

Contaminants released to the ground surface migrated through the unsaturated zone, as controlled by the chemical and physical differences between the contaminants and the surrounding media, gravity, and pressure (head). Once in the unsaturated zone, contaminants may have sorbed to soil or organic matter, become trapped in residual pore spaces, or continued to leach to the saturated zone. Although the explosives and VOCs have lower K_{oc} values, the contaminants could still sorb to soil in areas of higher clay or total organic carbon content. The high-molecular-weight PAHs and PCBs have a strong tendency for sorption. Once in the soil, contaminants can enter the gas phase through volatilization of soil contaminants. Higher soil temperatures in the upper few feet of soil occur during the summer and can lead to increased volatilization. Constituents sorbed or complexed to surface soil may be transported to sediment via surface water runoff.

The IAAAP includes areas that are covered by asphalt, concrete, buildings, and heavy vegetation. In portions of the site that are covered by impermeable asphalt or concrete, infiltration into the subsurface and potential leaching of contaminants in the unsaturated zone is significantly limited. In those areas of the site that are vegetated, there is little to no restriction for infiltration. Explosives, VOCs, and low-molecular-weight PAHs have leached from the unsaturated zone to groundwater. In contrast, due to the high sorption potential and low water solubility of high-molecular-weight PAHs and PCBs, these contaminants are largely immobile in the unsaturated zone and unlikely to appreciably leach to groundwater. Based on their moderate volatility, PCBs may evaporate into soil gas and then into the atmosphere; however, volatilization would be limited due to adsorption to soil.

Most metals at the IAAAP are naturally occurring in the environment and not associated with a CERCLA release. In southeast Iowa, iron and manganese have been identified as being problems and are frequently detected at concentrations above recommended screening values (Coble, 1971). The mobility of metals in the unsaturated zone is highly dependent on the subsurface conditions. Surface soil and shallow subsurface soil (within the top 2 feet of the ground surface) exist under more oxidizing conditions due to the proximity to outdoor air; therefore, aluminum, manganese, and iron will tend to be in their immobile forms of aluminum hydroxides, manganese oxides, and iron hydroxides. In oxidizing environments, arsenic and chromium are typically present in forms that are more mobile (ERG, 2005). However, these metals, along with lead, thallium, and zinc, will potentially sorb or complex with clays, organic material, iron hydroxides, or manganese oxides, limiting their mobility.

4.2.2.2 Surface Water, Sediment, and Stormwater Runoff Migration

Intermittent stormwater runoff can transport contaminants in surface soil and deposit them potentially in creeks at the IAAAP. Transport occurs when contaminants are either dissolved in the stormwater/ runoff or sorbed to particulate matter small enough to be carried by the intermittent stormwater flow. Runoff may be locally limited by vegetation, where present.

Once the contaminants are transported to the surface water features, they can be further carried with surface water flow. Heavier particles will tend to deposit to the bottom as sediment, unless the surface water flow is strong. Volatilization of volatile contaminants would be rapid from shallow surface water, particularly if there is shallow turbulent flow, such as that which occurs in small creeks.

Within the creeks, explosives and VOCs would be expected to dissolve in surface water. The VOCs would volatilize quickly, but the explosives would be more likely to stay dissolved in water. Any high-molecular-weight PAHs and PCBs would preferentially stay sorbed to sediment and be migrated only via particle entrainment. Low-molecular-weight PAHs and PCBs may moderately volatilize into the atmosphere, although volatilization would be limited due to adsorption to sediment. In contrast, high-molecular-weight PAHs are unlikely to evaporate. Unlike surface soil, sediment is often subject to more reducing conditions due to the presence of organic matter, which may facilitate biological redox reactions.

4.2.2.3 Saturated Zone Migration

Contaminants have entered groundwater at the IAAAP primarily by leaching through unsaturated zone soil. However, sumps at the IAAAP, which were located below the water table, may have also contributed to groundwater contamination. Contaminants in the overburden aquifer have been transported from the source release areas through advection and dispersion. Advection is the primary transport mechanism and includes the transport of dissolved contaminants by the bulk motion of flowing groundwater. Dispersion is the spreading of dissolved contaminants from the path they would be expected to follow during advection due to the spatial variation in aquifer permeability, fluid mixing, and molecular diffusion. Contaminants in groundwater may volatilize into unsaturated zone soil gas at the water table interface.

Groundwater flow in the overburden aquifer is influenced by the hydrologic watersheds and flows generally southeasterly or southwesterly toward Brush Creek, Long Creek, Spring Creek, and the Skunk River. Groundwater contaminants near these waterbodies may discharge through sediment and into surface water in portions of the creeks that are considered gaining. Due to differences in the permeability, groundwater discharge is greater in the alluvium than in the glacial till. However, when surface water levels are high, during periods of high precipitation, surface water may serve as a recharge point for groundwater. Groundwater contaminants may also discharge into localized drainage ditches; however, this is less likely since the drainages are often dry at the IAAAP. Groundwater discharge to surface water bodies is indicated by upward vertical gradients. Overburden aquifer groundwater can also flow downwards toward the bedrock aquifer. This would be indicated by downward vertical gradients. However, contaminant migration between the aquifers would be limited due to physical differences between the surficial (overburden) geology and the primary bedrock matrix and pressure (head). Groundwater in bedrock flows primarily through secondary porosity features, like fractures. Where the bedrock crops close to the surface, groundwater flow is also influenced by the watersheds.

Contaminants typically will not move as rapidly as groundwater because of retardation, or the adsorption of the contaminant to the solid media. Retardation can be a significant factor for groundwater COPCs within the overburden aquifer, which is composed primarily of clays and silts. Retardation will not be important where sand lenses are present from the glacial meltwater.

As previously mentioned, organic contamination in groundwater is composed primarily of explosives and VOCs. The explosives have moderate solubilities, but relatively low sorption potential. Therefore, they are subject to moderate migration, which may vary based on the specific constituent. The VOCs in groundwater may volatilize into soil gas overlying the water table. These constituents also have high to moderate aqueous solubilities and have the potential to migrate once dissolved in groundwater. All of the organic groundwater COPCs are subject to biodegradation.

Transport and partitioning of metals in water is dependent on the oxidation state of the metal and on interactions with the other materials present. Under reducing conditions, iron and manganese would be expected to be transformed into more soluble forms. Any metals (such as arsenic and zinc) which may be naturally bound to iron hydroxides and manganese oxides can also become more mobile. Arsenic can also coprecipitate in groundwater.

4.3 Risk Assessment Approach

Risk assessments were conducted to assess the potential for unacceptable risk or hazards to human health and adverse effects to the environment posed by site-related contamination. The media evaluated for the areas included in this report are detailed in Section 5 and summarized below.

- Groundwater: EBPs, WBPA, NBPs, NBPLF, and FTP.
- Surface Water: WBPA.
- Sediment: WBPA.

Risk assessments were not conducted for soil within the EDA, as this media has been addressed under OU-1.

4.3.1 Human Health Risk

This section provides the general method used in the HHRAs. As noted in Section 1.2.4, site-specific discussions for the IAAAP sites included in this report are provided in Section 5. The results of the site-specific HHRAs are also included in Section 5 to provide a more comprehensive CSM for each of these IAAAP areas. The supporting risk tables are provided in Appendix A.

The approach and assumptions used in the HHRA are consistent with those provided in the final UFP-QAPP (CH2M, 2017a), except for some deviations that were agreed to during meetings or correspondence with USACE and USEPA following approval of the final UFP-QAPP, and are consistent with those provided in the interim HHRAs for Line 2, Line 6, and Building 600-86 (CH2M, 2019, 2020c; Leidos, 2020). While none of these sites are included in this report, the IAAAP project team agreed that these interim deliverables would serve as examples for the HHRA approach at all of the IAAAP sites, including the sites included in this OU-10 RI report. The purpose of these interim deliverables, as stated for Superfund Sites in the USEPA's *Risk Assessment Guidance for Superfund (RAGS*), is to present the planning documents, specifically RAGS Part D Tables. The interim HHRAs presented the exposure scenarios, analytical data, data groupings, results of the screening for COPCs, exposure point concentrations (EPCs) in exposure media, exposure factor values for receptors, and toxicity values for the COPCs.

HHRAs were completed for all of the IAAAP sites included in this RI report. The primary objective of each HHRA was to evaluate and document the potential risks and hazards to human health associated with potential current and future exposures to chemicals at these IAAAP sites in the absence of any remedial action. The HHRAs were completed in accordance with the USEPA's *RAGS, Volume I, Human Health Evaluation Manual* [HHEM]*,* Parts A, D, E, and F (USEPA, 1989, 2001a, 2004, 2009); HHEM *Supplemental Guidance: Update of Standard Default Exposure Factors* (USEPA, 2014a); and *Risk Assessment Handbook, Volume I: Human Health Evaluation* (USACE, 1999). If there are inconsistencies between the methods presented in the USACE and USEPA guidance documents, preference is given to USEPA guidance in the risk assessment.

The HHRAs consist of a four-step evaluation process:

1. **Data evaluation and identification of COPCs.** Identification of the appropriate HHRA data set and selection of the COPCs, including concentration contributions from both site-related COPCs and naturally occurring chemicals. COPCs identified in this step are the focus of the subsequent steps of the HHRA.
2. **Exposure assessment.** Identification of potential pathways of human exposure, characterization of the potentially exposed populations, and estimation of the magnitude, frequency, and duration of exposures.
3. **Toxicity assessment.** Assessment of the potential adverse effects of the COPCs (site-related COPCs and naturally occurring chemicals) and compilation of the toxicity values used for developing numerical risk and hazard estimates.
4. **Risk characterization.** Integration of the results of the exposure and toxicity assessments to develop numerical estimates of potential health risks and hazards, including a discussion of sources of uncertainty associated with the data, method, and exposure and toxicity values used in the HHRA. For each IAAAP site, the risk characterization is a four-step process that (1) presents estimates of potential risks and hazards that include contributions from site-related COPCs and naturally occurring chemicals; (2) presents risks and hazards due to background and identifies naturally occurring chemicals; (3) presents risks and hazards from site-related COPCs; and (4) through weight-of-evidence evaluations, identifies final COCs, if any, that warrant further evaluation in a Feasibility Study. The identification of no COCs indicates the conditions for NFA are met on an HHRA basis.

4.3.1.1 Potential Receptors

The following potential current and future human receptors were considered for the IAAAP sites included in this RI report, and the exposure scenarios applicable to each site are discussed in the HHRAs, as provided in Section 5.

Potential Current Exposure Scenarios

- **Hunters/Recreators.** Hunters/recreators could contact sediment and surface water in permanent water bodies. To effectively manage the overpopulation of deer, limited recreational hunting is permitted at some areas within IAAAP (Appendix A-1). Recreational trapping of fur-bearing mammals is also allowed during limited times of the year. For an individual site, potential exposures to hunters were evaluated only if hunting/trapping is permitted at the site, as shown in Appendix A-1, Attachment 1. For the IAAAP sites included in this RI report, surface water and sediment exposures for the entire EDA were evaluated with the WBPA.
- **Site Workers.** Site workers could be exposed to COPCs in indoor air (which may be impacted by VOCs migrating from groundwater). Potential indoor air exposures to current site workers were only considered at sites with currently active buildings. Although the NBPLF itself is inactive, there is an actively occupied building (Building BG-199-4) at this IAAAP area. A current site worker scenario was only evaluated for indoor air risks and hazards if the estimated risks and hazards for a hypothetical

residential scenario exceeded acceptable risk and hazard levels and COCs were identified for a residential scenario.

Potential Future Exposure Scenarios

- **Site Workers.** Future site workers could contact groundwater if groundwater is used as a future drinking water source at the IAAAP sites. Additionally, future site workers could contact COPCs in indoor air (that may be impacted by VOCs migrating from groundwater) in existing buildings or in potential future buildings if a site is redeveloped. However, potential exposures and risks and hazards to site workers were estimated in the HHRAs only if the estimated risks and hazards for a hypothetical residential scenario—potable use or vapor intrusion (VI)—exceeded acceptable risk and hazards levels and COCs were identified for a residential scenario.
- **Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert. For groundwater, potential exposures and risks and hazards to construction/utility workers are estimated in the HHRAs only if the estimated risks and hazards for a hypothetical residential scenario (potable use) exceed acceptable risk and hazards levels and COCs were identified for a residential scenario. Based on conversations with staff at IAAAP, replacing culverts is infrequent (i.e., every few years over a duration of approximately 2 weeks), and contact with shallow groundwater is expected to be minimal (i.e., less than 1 hour per day during culvert replacement). Additionally, repairs to sewer or water lines are very infrequent, are completed in 1 or 2 days and are too insignificant to evaluate in the HHRAs.
- **Hypothetical Residents.** Future hypothetical residents (young child ages 0 to 6 years and adult) may contact groundwater based on potential future use as a potable water source at the IAAAP sites. Additionally, future residents could contact COPCs in indoor air (that may be impacted by VOCs migrating from groundwater) if future residences are constructed at the IAAAP areas included in this report.

Although the current and expected future Land Use of the IAAAP is Commercial/Industrial, hypothetical future residents are being evaluated for exposures to groundwater at the OU-10 areas as a means for determining if the conditions meet the criteria for NFA or UU/UE. Although none of the areas at the IAAAP are anticipated to undergo residential redevelopment, the hypothetical residential scenario allows for evaluation of the least restrictive land use scenario. According to "Land Use in the CERCLA Remedy Selection Process" (USEPA, 1995), the presence of contaminants in media at concentrations protective of residential exposures allow for unrestricted land use and negates the need for further action for a human health risk scenario.

The human health conceptual exposure model (CEM) for each IAAAP site in this report is discussed in Section 5. The media and potential exposure scenarios evaluated for each site are provided in Table 4.3-1.

4.3.1.2 Data Evaluation and Identification of Chemicals of Potential Concern

Data Evaluation

The data evaluation step involves gathering and reviewing available site data and identifying a data set of acceptable quality for the HHRAs. Soil and groundwater samples from historical investigations and from the recent investigations conducted between 2018 and 2020, as documented in the final UFP-QAPP (CH2M, 2017a), were included in the HHRAs. The historical data were evaluated to determine whether they were likely to still be representative of current site conditions. The data sets included in the HHRAs for each site are discussed in Section 5.

The data were evaluated using the following procedures:

- A value qualified as "B" or "J" was treated as a detected value.

- "U" qualified results were treated as nondetected values.
- "UJ" qualified results were treated as nondetected values, with the reporting limit being estimated.
- "R" (rejected) qualified results were not included in the HHRA data sets.
- For sample locations where a duplicate sample or a split sample was collected, the highest detected concentration among the original, duplicate, or split samples was used when a chemical was detected in any sample. If all results were nondetect, the lowest reported detection limit (DL) (that is, RL) was used.

Groundwater Data Groupings

For a future potable use scenario, groundwater samples collected from the overburden and bedrock aquifers within a site boundary were combined (if bedrock groundwater was potentially impacted and sampled), and groundwater was assumed to be potable at all depths. USEPA guidance (USEPA, 2014b) recommends that only "total" concentrations be used to evaluate a potable use scenario if both "total" and "dissolved" metals data are available in the groundwater data set; therefore, only "total" metals data were presented in the risk assessment tables and text of the HHRAs.

For the VI pathway, groundwater samples collected from the overburden and bedrock aquifers within a site boundary were combined. The groundwater samples were not collected at multilevel wells; therefore, a separate data grouping was not used to evaluate the VI pathway (i.e., the same data grouping was used for potable use and the VI pathway scenarios).

Surface Water/Sediment Data Groupings

Surface water and sediment samples were collected from perennial surface water features and were used to evaluate hunting and other recreational activities if permitted at these sites.

Selection of Site-related Chemicals of Potential Concern and Naturally Occurring Chemicals

The COPCs (site-related COPCs or naturally occurring chemicals) are those chemicals that, based on screening, have the potential to cause adverse human health effects if receptors contact site media. Chemicals considered to be essential nutrients (calcium, magnesium, potassium, and sodium) were not selected as COPCs in the HHRAs because they are toxic only at high doses and high concentrations of essential nutrients are not present at the sites.

Chemicals that were 100 percent not detected in a data grouping were not identified as COPCs for that data grouping; however, an evaluation of the 100 percent nondetected chemicals within a medium was included in the Uncertainty Analysis sections in the HHRAs. DLs and RLs (if available) for chemicals that were 100 percent nondetected in a medium were compared against SLs. Chemicals with exceedances are discussed regarding the age of data, the potential to be related to former site activities, and the potential to be associated with laboratory contamination. The detection of a chemical within that medium on an IAAAP facility-wide basis at a frequency greater than 5 percent (based on historical non-FUSRAP facility data) was also considered when determining the significance of the DL or RL above its SL and its potential to be site-related. The results of the evaluation for the nondetected chemicals are provided in Section 5.

Screening Levels

The SLs used in the HHRA for each exposure medium are described below. A detected chemical was retained as a COPC (site-related COPC or naturally occurring chemical) in an exposure medium if the maximum detected concentration exceeded the corresponding SL for that exposure medium.

- **Groundwater (Potable Use).** Concentrations detected in groundwater for a potable use scenario were compared to USEPA's tap water RSLs (USEPA, 2023a). For lead, the groundwater concentrations were compared to the USEPA's Action Level of 15 µg/L. USEPA's MCLs (USEPA, 2009) were included in the groundwater screening tables for comparison purposes (i.e., as an applicable or relevant and appropriate requirement) but were not used to select COPCs. If an MCL was not available, the Lifetime Health Advisory (USEPA, 2018c) was provided for comparison purposes. The MCLs are enforceable standards and are used as a line of evidence in the risk characterization to determine final COCs in the HHRAs.

- **Groundwater Vapor Intrusion.** Concentrations detected in groundwater for the VI pathway were compared to USEPA's groundwater vapor intrusion screening levels (VISLs), calculated using the VISL Calculator (USEPA, 2023b). The default groundwater to indoor air attenuation factor of 0.001 and IAAAP-specific average groundwater temperature of 13 degrees Celsius (based on groundwater samples collected from 2000 to 2018) were used in the VISL calculations. The VISL Calculator input and output is provided in Appendix A-1, Attachment 3. Chemicals detected in groundwater that were not considered to be sufficiently volatile were excluded as COPCs for the VI pathway.[2]
- **Surface Water/Sediment.** Concentrations detected in surface water and sediment were compared to SLs calculated for a recreational scenario (i.e., adult and adolescent hunters) using the RSL online calculator. An exposure frequency of 26 days/year and an exposure time of 2 hours/event was used; the body weight used for the adolescent hunter is 44.3 kilograms (kg). The RSL calculator input and output are provided in Appendix A-1, Attachment 4, Table 1 and Table 2, respectively; Table 1 presents the exposure factors for receptors.

The RSLs and VISLs were based on a target excess lifetime cancer risk (ELCR) of 1×10^{-6} and a noncancer HQ of 0.1. The HQ of 0.1 was used as the target hazard level for noncarcinogenic health endpoints to account for the potential presence of multiple chemicals affecting the same target organ. For those chemicals with a carcinogenic-based RSL and a noncarcinogenic-based RSL, the lowest value was selected as the final RSL for that chemical. If the maximum detected concentration of a constituent exceeded its respective SL, it was retained as a COPC (site-related COPC or naturally occurring chemical) in the HHRA.

The BTVs are provided in the COPC screening tables for comparison purposes and were not used as a basis for selecting or eliminating COPCs. Instead, the BTVs are used to determine which chemicals are naturally occurring at the sites, as provided in the nature and extent evaluations in Section 5. The results of the background comparisons are used in the risk characterization process to distinguish between naturally occurring chemicals and site-related COPCs. For sites where no known or suspected release of metals has occurred, if the site maximum detected concentration (MDC) is less than the upper tolerance limit for the BTV, the metal is considered naturally occurring. If the site MDC is greater than the background upper tolerance limit, the metal is considered site-related.

4.3.1.3 Exposure Assessment

An exposure assessment is used to evaluate potential exposures to site media by the human receptors identified for current and anticipated future land uses at the IAAAP sites. The exposure assessment identifies potential human receptors, potential exposure pathways, exposure factor values, and EPCs.

Exposure Pathways Quantified in the HHRA

An exposure pathway can be described as the physical course that a chemical takes from the point of release (or source) to a receptor. To be complete, an exposure pathway must have all the following components:

- A source (such as constituent residues in an environmental medium).

[2] Chemicals with a Henry's Law Constant value greater than or equal to 1×10^{-5} atm-m^3/mole or a vapor pressure greater than or equal to 1 mm Hg are considered by USEPA to be sufficiently volatile.

- A mechanism for chemical release and migration (such as groundwater infiltration).
- An environmental transport medium (such as groundwater).
- A point of potential human contact (exposure point, such as tap water).
- A route of intake (such as ingestion, dermal contact, or inhalation).

In the absence of any one of these components, an exposure pathway is considered incomplete, and, by definition, there is no risk or hazard.

Groundwater is not currently being used as a potable water source and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the IAAAP sites is classified as Class IIB, a potential source of drinking water (USEPA, 1989). Therefore, the evaluation of future residential exposures to groundwater has been included in the HHRA. It is assumed that future hypothetical residents could use groundwater as a potable water source. Ingestion, dermal contact, and inhalation exposures to COPCs in groundwater were estimated in the HHRA based on a potable use scenario. Additionally, hypothetical future residents could also inhale volatile groundwater chemicals (if present in groundwater) that have migrated to indoor air from VI.

The potential exposure pathways quantified for each site are discussed in the HHRAs, as provided in Section 5.

Exposure Point Concentrations

The upper confidence limit (UCL) of the mean concentration was calculated for each COPC where at least eight samples were available and at least four detected concentrations were observed. The UCLs were estimated following the most recent parametric (distributional) and nonparametric USEPA recommendations in ProUCL (Version 5.1.002) (USEPA, 2016). ProUCL provides approaches for calculating UCLs particularly when nondetected concentrations are present. These approaches consider a large variety of input including the perceived distribution of the detected results (if no perceived distribution is acceptable, nonparametric alternatives are provided), sample size, variability, and skewness. The arithmetic mean concentrations provided in the RAGS Part D Table 3 series were calculated using only detected results. For exposure media where lead was identified as a COPC, the arithmetic mean concentration was used as the EPC.

If a groundwater plume[3] was identified for a site, the groundwater EPCs were calculated based on the data collected in the core of the plume, in accordance with USEPA's *Determining Groundwater Exposure Point Concentrations, Supplemental Guidance* (USEPA, 2014b). When eight samples and at least four detected concentrations were available from the core of the plume, the EPC was calculated as the UCL on the mean; otherwise, the maximum detected concentration was used as the EPC. If no plume was identified for a site, all samples in the groundwater data set were used to calculate the EPCs for the COPCs in groundwater. EPCs are also calculated as the UCL on the mean when eight samples and at least four detected concentrations were available for the site groundwater; otherwise, the maximum detected concentration was used as the EPC.

Exposure Factors and Chemical Intake Calculations

A reasonable maximum exposure scenario was quantified for potential residential receptors under a hypothetical future land use scenario (USEPA, 1989). USEPA defines the reasonable maximum exposure as the highest exposure that could reasonably be expected to occur for a given exposure pathway at a site and is intended to account for both uncertainty in the chemical concentration and for variability in

[3] A plume is interpreted as a three-dimensional, dynamic (i.e., may vary temporally), potentially irregular distribution of contaminants dissolved or suspended in groundwater (USEPA, 2014b).

the exposure parameters (such as exposure frequency or averaging time). If available, site-specific values are applied as equation inputs. In the absence of site-specific values, default values are obtained or calculated based on values provided in current USEPA guidance such as the HHEM *Supplemental Guidance: Update of Standard Default Exposure Factors* (USEPA, 2014a). The exposure factors used in the HHRAs are provided in the RAGS Part D Table 4 series for each site (Appendix A).

The exposure factors are used as equation inputs for calculating chemical intakes. A chemical intake occurs when a chemical is taken into the body via a route of exposure (i.e., ingestion, dermal contact, or inhalation) and is subsequently absorbed into the bloodstream. Depending on the exposure duration, exposures are characterized as chronic or subchronic. Chemical intakes via all routes are calculated in accordance with the USACE's *Risk Assessment Handbook* (USACE, 1999) and USEPA's RAGS Part A (USEPA, 1989). Additionally, dermally absorbed doses are calculated for dermal exposures in accordance with USEPA's RAGS Part E (USEPA, 2004), and air exposure concentrations (ECs) are calculated for inhalation exposures in accordance with USEPA's RAGS Part F (USEPA, 2009).

Calculations of chemical intakes are provided in the RAGS Part D Table 7 series for each area-pathway-receptor combination (Appendix A).

For hypothetical future residents, noncarcinogenic exposures are calculated separately for child (0 to 6 years) and adult residents as daily intakes. For carcinogenic exposures, daily intake rates are age-adjusted based on child (0 to 6 years) and adult parameters (e.g., intake rates, exposure duration, and body weights) and averaged over a lifetime (i.e., 70 years).

Approach for Mutagenic Exposures

For COPCs with a mutagenic mode of action (MMOA) for carcinogenesis, in the absence of age-specific toxicity data, the risk for exposures that occur at early life stages was estimated by applying the default age-dependent adjustment factors (ADAFs) to address the potential for increased carcinogenic potency associated with exposure during early life (less than 16 years of age). Consistent with the *Cancer Guidelines* (USEPA, 2005a) and *Supplemental Guidance* (USEPA, 2005b), the estimated risks for specific age groups were calculated using the following ADAFs: less than 2 years (ADAF of 10), 2 to less than 16 years (ADAF of 3), and greater than 16 years (ADAF of 1).

Approach for Lead Exposures

The potential risks associated with lead exposures for a hypothetical residential scenario were addressed using the Integrated Exposure Uptake Biokinetic (IEUBK) Model and USEPA's recommended input parameter values (USEPA, 1994, 2010, 2017b, 2017c, 2021). The IEUBK Model was designed to provide predictions of the probability of elevated blood lead levels (BLLs) for children. This model addresses three components of environmental risk assessments—the multimedia nature of exposures to lead, lead pharmacokinetics, and significant variability in exposure and risk—through estimation of probability distributions of BLLs for children exposed to similar environmental concentrations. The measured site concentration, calculated as the arithmetic mean, was used for the exposure medium where lead was identified as a COPC, and the default ECs embedded in the IEUBK Model were used for exposure media where lead is not a COPC.

In 2012, the Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) conducted a critical review of available lead toxicity studies and reported that the overall weight of evidence substantiates that neurocognitive decrements (as well as other adverse systemic effects, such as cardiovascular, immunological, and endocrine effects) can occur in children, even when BLLs are less than 10 micrograms per deciliter (µg/dL) (ACCLPP, 2012). Based on the conclusion that BLLs below 10 µg/dL can harm children, the ACCLPP and Centers for Disease Control and Prevention (CDC, 2007) have recommended that a revised reference value of 5 µg/dL of blood lead be used to identify children with elevated BLLs. Therefore, the blood lead reference level of 10 µg/dL was replaced with the reference level of 5 µg/dL in the IEUBK Model, in accordance with the final UFP-QAPP (CH2M, 2017a). Additionally, the default maternal blood lead concentration at childbirth was updated from 1 µg/dL to 0.6 µg/dL in the IEUBK Model, as recommended by USEPA (2017b). In accordance with recent USEPA guidance (USEPA, 2017c, 2021), the default age range for children was changed from 0 to 84 months to 12 to 72 months because soil and dust ingestion rates are generally lower for children aged 0 to 12 and 72 to 84 months.

4.3.1.4 Toxicity Assessment

The toxicity assessment describes the relationship between the magnitude of exposure to a constituent and the possible severity of adverse effects and weighs the quality of available toxicological evidence. Where possible, this assessment provides a numerical estimate of the increased likelihood and/or severity of adverse effects associated with chemical exposure (USEPA, 1989).

The toxicity values for carcinogenicity (oral cancer slope factors [CSFs] and inhalation unit risks [IURs]), as well as for noncarcinogenic effects (oral reference doses [RfDs] and inhalation reference concentrations [RfCs]), that are used in the HHRAs were obtained from the USEPA standard hierarchy of toxicity value sources (USEPA, 2003b), as follows:

- Tier 1 Source—Integrated Risk Information System (USEPA, 2023c).
- Tier 2 Source—USEPA Provisional Peer-Reviewed Toxicity Values.
- Tier 3 Sources—Other peer-reviewed federal and state toxicity values, as cited in the RSL table (USEPA, 2023a).[4]
  - Agency for Toxic Substances and Disease Registry (ATSDR, 2020).
  - California Environmental Protection Agency toxicity database (Cal EPA, 2020).
  - USEPA's Health Effects Assessment Summary Tables (USEPA, 1997a).

The noncarcinogenic toxicity values and carcinogenic toxicity values used in the HHRAs are provided in the RAGS Part D Table 5 series and 6 series, respectively, for each site (Appendix A).

Noncarcinogenic Toxicity Values

Noncarcinogenic hazards typically are quantified by comparing intakes to oral RfDs and inhalation RfCs. The RfD is a health-based dose, expressed as a constituent intake rate in units of milligrams of chemical per kilogram body weight per day (mg/kg-day). The RfC is an allowable, health-based concentration of a constituent in air expressed in units of milligram per cubic meter (mg/m^3). Both the RfD and RfC are based on the assumption that thresholds exist for certain toxic effects, such as liver or kidney damage, but may not exist for other toxic effects such as carcinogenicity. In general, the RfD and RfC are estimates (with uncertainty spanning perhaps an order of magnitude) of daily exposures to the human population (including sensitive subgroups) that are likely to be without an appreciable risk of deleterious effects during a lifetime of exposure (USEPA, 1989).

Noncarcinogenic toxicity values are available for both chronic and subchronic exposures. As a guideline, chronic RfDs and RfCs are used to evaluate the potential noncarcinogenic effects associated with exposure periods greater than 7 years (approximately 10 percent of a human lifetime). Chronic RfDs and RfCs are applied in the hazard calculations for the following IAAAP receptor scenarios: site worker, hunter/recreator, and hypothetical residents (child and adult). Subchronic oral RfDs and inhalation RfCs are developed specifically to be protective for short-term exposures. As a guideline, USEPA recommends that subchronic toxicity values be used to evaluate potential noncarcinogenic effects of exposure periods between 2 weeks and 7 years. For the IAAAP sites included in this RI report, subchronic RfDs and

[4] The Tier 3 toxicity value sources used in the HHRAs were identified as appropriate by the USEPA and are consistent with the USEPA's RSL User's Guide (May 2023). Priority was given to toxicity value sources that are most current, peer reviewed, transparent, and publicly available.

RfCs are applied in the hazard calculations to only the construction/utility worker scenario, for which a combined exposure frequency and duration is assumed to be less than 1 year.

Carcinogenic Toxicity Values

Potential carcinogenic risks were quantified using oral CSFs and IURs. The CSF is defined as a plausible upper-bound estimate of the probability of developing cancer per unit intake of a constituent over a lifetime (USEPA, 1989). In general, CSFs can be derived from the results of chronic animal bioassays, human epidemiological studies, or both. CSFs, which are expressed in units of kilogram body weight per day per milligram chemical (kg-day/mg or $[\text{mg/kg-day}]^{-1}$), were used to estimate upper-bound lifetime statistical probabilities of current and future receptors developing cancer because of exposure to COPCs in site media. The IUR is defined as the upper-bound ELCR estimated to result from continuous exposure to a chemical at a concentration of 1 $\mu g/m^3$ in air. IURs are expressed in units of cubic meter of air per micrograms of chemical ($m^3/\mu g$ or $[\mu g/m^3]^{-1}$).

Derivation of Dermal Toxicity Values

Oral RfDs and CSFs were converted to dermal RfDs and CSFs using an oral-to-dermal adjustment factor. The values used for this conversion were obtained from *RAGS Part E* Section 4.2 and Exhibit 4-1 (USEPA, 2004). Following USEPA's recommendation, such a conversion was performed only when a chemical has a gastrointestinal absorption factor of less than 50 percent. If a chemical-specific adjustment factor was not available, a default value of 100 percent was used.

If the gastrointestinal absorption factor was less than 50 percent, the dermal RfD was derived by multiplying the oral RfD by the gastrointestinal absorption factor as shown with the following equation:

$$RfD_d = RfD_o \times ABS_{GI}$$

where:

RfD_d	=	Dermal reference dose (mg/kg-day)
RfD_o	=	Oral reference dose (mg/kg-day)
ABS_{GI}	=	Fraction of constituent absorbed in the gastrointestinal tract (unitless)

The dermal CSF was derived by dividing the oral CSF by the gastrointestinal absorption factor as shown with the following equation:

$$CSF_d = \frac{CSF_o}{ABS_{GI}}$$

where:

CSF_d	=	Dermal cancer slope factor $(\text{mg/kg-day})^{-1}$
CSF_o	=	Oral cancer slope factor $(\text{mg/kg-day})^{-1}$
ABS_{GI}	=	Fraction of constituent absorbed in the gastrointestinal tract (unitless)

Special Considerations

The Integrated Risk Information System oral RfD for manganese (0.14 mg/kg-day) includes manganese from all sources, including diet (USEPA, 2023c). An oral RfD for nondiet exposures was calculated by subtracting the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) and applying a modifying factor of 3 to address uncertainties associated with nonfood manganese exposure sources, resulting in an oral "nondiet" RfD of 0.024 mg/kg-day. This oral "nondiet" RfD was used to estimate potential noncarcinogenic HQs associated with exposures to manganese in groundwater at the OU-10 sites.

The oral RfD for vanadium (0.005 mg/kg-day) was derived from the oral RfD for vanadium pentoxide (0.009 mg/kg-day). The vanadium oral RfD was calculated by factoring out the molecular weight of the oxide ion. The two atoms of vanadium contribute 56 percent of the molecular weight for vanadium pentoxide. Therefore, the oral RfD for vanadium pentoxide was multiplied by 56 percent to calculate the oral RfD for vanadium (0.005 mg/kg-day). This calculated RfD was used to estimate potential noncarcinogenic HQs associated with exposures to vanadium in groundwater at the IAAAP sites.

The toxicity values for hexavalent chromium were used to estimate potential noncarcinogenic HQs and carcinogenic risks for total chromium due to the lack of speciated chromium data available for media at IAAAP sites. Hexavalent chromium is typically present as a fraction of the total chromium concentrations; therefore, using the hexavalent chromium toxicity values to evaluate total chromium detected in site media is a conservative approach.

Quantitative oral toxicity values are not available for lead; therefore, potential exposures to lead for a hypothetical residential scenario were addressed using USEPA's IEUBK model (USEPA, 2010) and USEPA's updated input parameter values, as discussed in Section 3.3.1.3.

4.3.1.5 Risk Characterization

Potential human health risks are discussed separately for noncarcinogenic and carcinogenic COPCs because of the different toxicological endpoints, relevant exposure durations, and methods used to estimate risk. The methodologies and equations used to estimate noncarcinogenic hazards and carcinogenic risks are discussed below.

Estimation of Noncarcinogenic Hazards

For the ingestion and dermal contact exposure routes, noncarcinogenic hazards were estimated by comparing the calculated intakes to RfDs. The calculated intake was divided by the RfD, as presented in the following equation. This ratio is referred to as the HQ:

$$HQ = {}^{Intake}\!/_{RfD}$$

where:

HQ	=	unitless hazard quotient
Intake	=	intake level (mg/kg-day)
RfD	=	reference dose (mg/kg-day)

Intake and RfD are expressed in the same units (mg/kg-day) and represent the same exposure period (i.e., chronic or subchronic). An HQ that exceeds 1 (i.e., intake exceeds the RfD) indicates that there is a potential for adverse health effects associated with exposure to that COPC for that specific exposure route.

Similarly, the HQ associated with the inhalation of a noncarcinogenic COPC is calculated as follows:

$$HQ = {}^{EC}\!/_{RfC}$$

where:

HQ	=	unitless hazard quotient
EC	=	air exposure concentration (mg/m^3)
RfC	=	reference concentration (mg/m^3)

An HQ that exceeds 1 (i.e., air EC exceeds the RfC) indicates that there is a potential for adverse health effects associated with exposure to that COPC for the inhalation exposure route.

To assess the potential for noncarcinogenic health effects posed by exposure to multiple COPCs and exposure routes, a hazard index (HI) approach was used (USEPA, 1989). This approach assumes that noncarcinogenic hazards associated with exposure to more than one COPC and exposure route are additive. Synergistic or antagonistic interactions among COPCs are not quantified. The HI may exceed 1 even if all the individual HQs are less than 1. The COPCs were separated by similar mechanisms of toxicity and toxicological effects and separate HIs were calculated for each specific target organ, target system, or critical effect on which the RfDs or RfCs are based.

Estimation of Carcinogenic Risks

The potential for carcinogenic effects due to exposure to site media was evaluated by estimating the ELCR. The ELCR is the incremental increase in the probability of developing cancer during one's lifetime above the background probability of developing cancer. The linear low-dose equations were used to estimate the incremental probability of an individual developing cancer over a lifetime because of exposure to potential carcinogens.

Potential ELCRs associated with ingestion and dermal exposure to individual carcinogens were calculated using CSFs and intake estimates. The equation used to estimate the potential ELCRs is as follows:

$$ELCR = Intake \times CSF$$

where:

ELCR	=	unitless excess lifetime cancer risk
Intake	=	intake level (mg/kg-day)
CSF	=	cancer slope factor $(\text{mg/kg-day})^{-1}$

Similarly, the ELCR associated with the inhalation of a carcinogenic COPC is calculated by multiplying the lifetime average EC by the IUR).

$$ELCR = EC \times IUR$$

where:

ELCR	=	unitless excess lifetime cancer risk
EC	=	air exposure concentration ($\mu g/m^3$)
IUR	=	inhalation unit risk $(\mu g/m^3)^{-1}$

The theoretical probability of developing cancer from exposure to two or more COPCs and by two or more exposure pathways was calculated by summing the ELCRs for each COPC.

Risk Characterization Process for IAAAP Sites Included in RI Report

This risk assessment document reflects certain procedural departures from the standard USEPA HHRA process that the Army routinely applies at its installations (USEPA, 1989). An example is the inclusion in the HHRA of onsite detected chemicals with concentrations that are either the same or less than those of their respective site-specific background concentrations (naturally occurring chemicals). Such an approach adds extraneous information into the HHRA process. The intent of COPC screening is to minimize the scope of risk assessments by eliminating chemicals that will have no bearing on risk and hazard outcomes, and per 40 Code of Federal Regulations 300.400(b)(1) CERCLA, background (naturally occurring) substances are not subject to remedial actions. The Army considers that initially computing risks and hazards for all detected chemicals only to secondarily recompute risks and hazards without the risks from the naturally occurring chemicals (background) is not useful and makes the risk assessment results confusing to the public. The knowledge of risks associated with naturally occurring chemicals does not contribute to the determination of remedial actions that may be required to address an impact from former DoD activities. Importantly, computing risks and hazards for chemicals without having first conducted background screening is not a conservative gesture. Groundwater background values were obtained from the technical memorandum *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army Ammunition Plant, Middletown, Iowa. Final* (CH2M, 2020a). This background comparison method is consistent with the UFP-QAPP (CH2M, 2017a, Worksheet #14). Although inconsistent with the process the Army uses for background in the HHRA for their installations, this method complies with the requests from the USEPA (USEPA, 2019) based on the OSWER 9285.6-07P guidance.

The risk characterization evaluations and results for the IAAAP sites included in this RI report were completed using a four-step process, as follows:

Step 1: Total Combined Risks and Hazards from Site-Related COPCs and Naturally Occurring Chemicals

Step 1 consists of calculation of receptor-specific ELCRs and HIs that include contributions from both site-related COPCs and naturally occurring chemicals. These total risk estimates are only provided for informational purposes per the request of the USEPA (USEPA, 2019). No decisions for future remedial actions are based on the total risk estimates. As stated in *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA, 1988) and *RAGS Part A* (USEPA, 1989), the risk characterization should be conducted to determine the potential risks and hazards associated with site-related contamination. Some contaminants can be both naturally occurring and site-related. However, chemicals that are considered naturally occurring at a site, or consistent with background, will be treated as naturally occurring chemicals in the risk assessment. Naturally occurring chemicals (and the estimated risks and hazards associated with their concentrations) are not site-related contaminants. The ELCRs and HIs calculated in Step 1 are not used to determine final COCs for a site.

Step 2: Risk Characterization of Naturally Occurring Chemicals

Step 2 consists of calculation of receptor-specific ELCRs and HIs for naturally occurring chemicals. Naturally occurring chemicals were identified using the IAAAP-specific BTVs; the comparison of metals concentrations to BTVs is provided in the nature and extent discussions for each site in Section 5. Risks and hazards associated with naturally occurring chemicals are not used to determine if remedial actions are warranted and are not considered in the determination of final COCs because they are consistent with background levels and not site-related.

Step 3: Risk Characterization of Site-Related COPCs

Step 3 consists of calculation of receptor-specific ELCRs and HIs for site-related COPCs. Site-related COPCs from this step are retained for the fourth and final step of the risk characterization.

Step 4: Final COC Determination

In this final step of the risk characterization, all site-related COPCs are evaluated quantitatively and qualitatively to determine which are final COCs (and require remedial actions, such as a Feasibility Study); if no COCs are identified, the site qualifies for an NFA decision per the HHRA.

USEPA guidance generally considers an acceptable site ELCR range to be within 1 in 1,000,000 to 1 in 10,000 (1×10^{-6} to 1×10^{-4}). Generally, remedial actions are not warranted for site media with an ELCR of 1×10^{-4} or less, or an HI of 1 or less. Lead is typically identified as a COC if the predicted BLLs in more than 5 percent of the exposed population exceed the reference BLL of 10 µg/dL. As discussed in Section 4.3.1.3 and in accordance with the final UFP-QAPP (CH2M, 2017), a reference BLL of 5 µg/dL was used for the HHRAs.

The final COCs were identified for a site based on the ELCRs and HIs calculated for the site-related COPCs in step 3 of the risk characterization. If an ELCR of 1×10^{-4} was exceeded for a receptor group, the COPCs posing an individual ELCR greater than 1×10^{-6} were identified as COCs. When a target organ–specific HI exceeded 1 for a receptor group, the COPCs posing an individual HQ greater than 0.1 for that target organ were identified as COCs. Groundwater COPCs for potable use and trenching scenarios detected at concentrations less than or equal to their respective MCLs were excluded as final COCs. COPCs detected above their respective MCL were included as COCs per OSWER Directive 9283.1-33, if applicable. Additionally, some COPCs may be excluded as final COCs based on a weight-of-evidence approach, such as a comparison of concentrations and risks and hazards based on “dissolved” and “total” metals data and a comparison of recent versus historical site concentrations.

4.3.1.6 Uncertainty Analysis

The assumptions used in the HHRAs have inherent uncertainty. While it is possible that this leads to underestimates of potential risk and hazards, the use of upper-bound assumptions most likely results in conservative estimates of potential risks and hazards. A receptor group’s potential exposure and subsequent potential risk and hazards are influenced by the exposure scenario and dose/response and vary on a case-by-case basis. The general uncertainties associated with the HHRAs are provided in Table 4.3-2. Site-specific uncertainties associated with each HHRA are provided in Section 5.

Typically, the very first screen, applicable to all categories of chemicals (e.g., inorganic, anthropogenic, etc.) is for frequency of detection. In brief, chemicals that occur in 5 percent or less of samples for a given medium, are usually eliminated because it is evident up front, that these chemicals will play an insignificant role. In this risk assessment, no chemicals were screened out based on frequency of detection. The second screen is typically a background screen, and it would be for naturally occurring chemicals only (principally inorganic compounds, such as metals). Organic chemicals such as pesticides or solvents should not be present in site background, and if they are, an alternate site background location must be sought. In this screening, the maximum onsite metal detection is typically compared with a value that is twice the mean concentration for the metal in site background. Where the maximum onsite concentration is less than “the two-times-the-background-mean” concentration, the metal is typically removed from all other consideration in the HHRA. In these risk assessments, the background screen was not done before the risk-based screening. USEPA recommends a baseline risk assessment approach that retains chemicals that exceed risk-based screening concentrations. USEPA’s approach described in *Role of Background in the CERCLA Cleanup Program* (EPA, 2002) “involves addressing site-specific background issues at the end of the risk assessment, in the risk characterization.” The third screening task is risk-based screening and was completed for these sites. The maximum detected onsite concentration of a chemical was compared to their current USEPA RSL table (USEPA, 2023a), wherein the values reflect a cancer risk level of 1×10^{-6} (for carcinogens), and an HQ of 0.1 in the case of systemic toxicants.

4.3.2 Ecological Risk

This section provides the general methods used in the ERA for the OU-10 RI report. As summarized in Section 1.2.4, this RI addresses groundwater at all five of the EDA areas included in this report (EBPs, WBPA, NBPs, NBPLF, and FTP). The WBPA also addresses surface water and sediment within Spring Creek and perennial tributaries within its boundary. Soil is not evaluated at any of the areas, as this media was addressed under OU-1.

A screening level ecological risk assessment (SLERA) was conducted for all five IAAAP areas included in this RI report. The purpose of the SLERA is to determine the potential for adverse ecological effects associated with exposures to site-related chemicals in environmental media in the absence of remediation. The SLERA uses conservative assumptions to screen the initial list of detected chemicals to identify those requiring further evaluation. The results of the SLERA are provided in Section 5, by site.

Several guidance documents were used to provide direction for developing the SLERA. These include, but are not limited to, the following:

- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final* (USEPA, 1997b).
- *Final Guidelines for Ecological Risk Assessment* (USEPA, 1998a).
- *Ecological Risk Assessment and Risk Management Principles for Superfund Sites* (USEPA, 1999).
- *The Role of Screening Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments* (USEPA, 2001b).
- *Wildlife Exposure Factors Handbook* (USEPA, 1993).
- *Environmental Quality Risk Assessment Handbook, Volume II: Environmental Evaluation* (USACE, 2010).
- *Final Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant, Middletown, Iowa* (UFP-QAPP) (CH2M, 2017).

In general, the approach and assumptions used in the SLERA are consistent with those provided in the final UFP-QAPP (CH2M, 2017), except for some deviations that were agreed to during meetings or correspondence with USACE and USEPA following approval of the final UFP-QAPP (i.e., use of the more current Region 4 ESVs instead of the QAPP-approved Region 5 ESLs as the primary source of screening values).

The USEPA provides a formal eight-step ERA process (USEPA, 1997b, 1998a), while not mandatory, it was followed to complete the SLERAs where applicable. It bears noting that this process is readily applied for CERCLA remedial investigations independent of considerations of the size, ecological relevance, or ecological significance of contaminated sites. Often however, a site may not need an ecological assessment based on the actual site features. The SLERA for the OU-10 RI followed the first two steps of the eight-step approach recommended by USEPA (1997b) as listed below:

- Step 1 of the ERA process is intended to answer two main questions: (1) Do complete exposure pathways exist? and (2) Are conservative screening levels available for the chemicals onsite to conduct the SLERA? If one or more complete exposure pathways are likely to exist, the ERA process continues to Step 2 for those pathways that have been determined to be critical. The available screening levels are then evaluated to determine whether they are adequate to evaluate the data in the SLERA. If not, additional screening levels are obtained from the scientific literature before the ERA process continues, or the ERA will be likely to move on to the refinement steps for chemicals or exposure routes lacking screening values.
- Step 2 of the ERA process involves conducting a screening exposure assessment, an effects assessment, and a risk calculation (risk characterization). The results of the SLERA are used to evaluate the potential for ecological adverse effects based upon very conservative assumptions. If the results of the SLERA suggest that further ecological evaluation or data collection is warranted, the ERA process then proceeds to the BERA (Steps 3 through 7), which is a more detailed phase of the ERA process, for the pathways, chemicals, receptors, and areas identified in the SLERA.

Following the SLERA, only the WBPA was carried to the BERA (see section 5.2.7). The following steps were conducted under the BERA:

- The first step of the BERA (Step 3) is the baseline problem formulation. The risk estimates from the SLERA are refined by the baseline problem formulation using more realistic exposure assumptions, and if adverse effects are still possible, the conceptual model and endpoints are refined to focus the subsequent steps of the ERA process.
- Following the completion of Step 3, a decision point is reached with two potential outcomes: (1) If the refined risk estimates are acceptable for each selected assessment endpoint, the investigation

advances to risk characterization (Step 7) to document this conclusion, and the ERA process terminates, or (2) the risk estimates indicate that adverse effects may exist and the ERA process continues (Steps 4 through 6). The additional data needed to support the ERA for the watersheds are presented in the approved UFP-QAPP (CH2M, 2018) and serve as the basis for Steps 4 through 6 of the ERA process.

The ERA process for the five IAAAP areas included in the OU-10 RI report began at Step 1 to determine if potentially complete exposure pathways are present at each site for the media included in this RI report (groundwater at all five areas and surface water and sediment at one area). The ERA for the OU-10 RI report only addresses aquatic environments. Terrestrial environments were not evaluated in the ERA as soil is not included in these OU-10 sites. There are perennial surface water features at three of the IAAAP areas in this RI report (EBPs, NBPs, and the WBPA). There are no perennial surface water features within the NBPLF or the FTP. Historically, ERAs have been conducted for various sites at IAAAP. In October 2004, a facility-wide BERA was conducted for soil, surface water, and sediment (MWH, 2004). The information available within the BERA regarding potential receptors, exposure routes, exposure factor values, and conclusions were reviewed and considered when developing the approaches and preliminary conceptual exposure models for the sites included in this RI.

4.3.2.1 Screening Level Problem Formulation (Step 1)

The screening level problem formulation establishes the goals, scope, and focus of the ERA. As part of the problem formulation, the environmental setting of the site is characterized in terms of the habitats and biota known to be or likely to be present. The types and concentrations of chemicals that are present in ecologically relevant media are also described based upon available analytical data. An ecological conceptual exposure model (ECEM) is developed that describes source areas, transport pathways and exposure media, exposure pathways and routes, and receptors. Assessment endpoints and measures are developed to evaluate those receptors for which ecologically significant exposure pathways exist.

Ecological Conceptual Exposure Model

Important components of the ECEM are the identification of potential source areas, transport pathways, exposure media, exposure pathways and routes, and receptor groups. The ECEM considered site-specific conditions that were observed at the IAAAP sites during RI field activities. A complete exposure pathway has three components: (1) a source of chemicals (stressors) that results in a release to the environment, (2) a pathway of chemical transport through an environmental medium, and (3) an exposure or contact point for an ecological receptor. In the absence of any one of these components, an exposure pathway is considered incomplete, and, by definition, there is no potential for adverse effects. Key components of this ECEM are discussed in the following subsections.

Transport Pathways and Exposure Media

A transport pathway describes the mechanisms whereby site-related constituents, once released, may be transported from a source to ecologically relevant media where receptor exposures may occur. Exposure media are the potentially contaminated media in which ecological receptors can come into contact. The primary mechanisms for transport from the source areas may include the following:

- Transport of chemicals via groundwater to sediment and surface water
- Surface water runoff with the potential to transport particulate-bound chemicals into the respective watershed, although this transport pathway is considered relatively minor
- Historical direct discharges

Exposure Pathways and Routes

An exposure pathway links a source of contamination with one or more receptors through exposure via one or more media and exposure routes. Exposure, and thus potential adverse effects, can occur only if a complete exposure pathway exists. An exposure route describes the specific mechanism(s) by which a receptor is exposed to a constituent present in an environmental medium.

Selection of Representative Species

To evaluate ecological exposure, representative species are selected for the functional feeding guilds identified in the ECEM. For example, a shrew may be considered representative of insectivorous mammals using the site. Consistent with *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final* (USEPA, 1997b), these representative species should preferably be ones that have ecological relevance, are of societal value, are susceptible to chemical stressors at the site, and allow risk managers to meet policy goals. These factors were used to select representative species common to terrestrial habitats within IAAAP. The representative species selected for each feeding guild and habitat type are as follows:

- Freshwater aquatic biota (fish, amphibians, water column invertebrates, and benthic infauna).
- Freshwater aquatic plants.
- Piscivorous birds—belted kingfisher (*Ceryle alcyon*).
- Piscivorous mammals—mink (*Mustela vison*).
- Sensitive species (utilizing riparian corridor)—Indiana bat (*Myotis sodalis*) (as a representative species for bats in general within the watershed, including the Northern long-eared bat (*Myotis septentrionalis*).

Assessment Endpoints and Measures

The conclusion of the screening level problem formulation is the identification of assessment endpoints and measures. Assessment endpoints describe the valued ecological resources that are to be protected (USEPA, 1998a). Assessment endpoints are selected according to their ecological relevance, their susceptibility to known or potential stressors onsite, and whether they reflect management goals for the site.

Measures are quantifiable and are predictive of assessment endpoints. The three categories of measures are measures of exposure, measures of ecological effects, and measures of ecosystem and receptor characteristics (USEPA, 1998a). They evaluate, respectively, how exposures might occur, the response of the assessment endpoints when exposed to the stressor, and the ecosystem characteristics that might affect exposure or response to the stressor. This assessment will include both measures of exposure and measures of ecological effects. Appropriate assessment endpoints and measures include survival, growth, and reproduction. Measures, in the form of suitable screening benchmarks, are the ESVs discussed in Step 2.

4.3.2.2 Screening Level Risk Calculation (Step 2)

Available Analytical Data

Analytical data evaluation involved gathering and reviewing available site data and identifying a data set of acceptable quality for the SLERA. The historical data were evaluated to determine if they were likely to still be representative of current site conditions. The data set included in the SLERAs are discussed in Section 5. The data were evaluated using the following procedures:

- Unqualified results were considered detected.
- A value reported as “B” (blank contamination) or “J” (estimated) qualified was treated as a detected value.

- "U" (undetected) qualified results were treated as nondetected values.
- "R" (rejected) qualified results were not included in the SLERA data set.

For samples with duplicate analyses, the higher of the two concentrations was used when both values were detects or when both values were nondetects. In cases where one result was a detect and the other a nondetect, the detected value was used in the assessment. For nondetected results, the sample quantitation (reporting) limit (SQL) was used to represent the concentration. When calculating statistics (such as arithmetic mean), the SQL was used by ProUCL for nondetected results.

Screening Level Exposure Estimate and Risk Calculation (Step 2)

The screening level risk calculation is the final step in the SLERA. In this step, MDCs for each applicable medium at each site were compared with corresponding and conservative ESVs to derive screening risk estimates. For example, maximum medium-specific concentrations for all detected constituents were compared to risk-based screening values without considering the fraction of time a receptor forages within a site. If ESVs were unavailable, then the constituents were carried forward for further evaluation.

Ecological Screening Levels

The ecological SLs that were used are described in the following text; here are five possible outcomes from the comparison:

- If the maximum concentration(s) in a medium did not exceed the ESV, the chemical was not considered a COPEC.
- If the maximum concentration was greater than the ESV and the BTV, the chemical was identified as a COPEC.
- If no ESV was available, the chemical was selected conservatively as a COPEC depending upon rationale and potential former use.

The ESVs were obtained using the selection hierarchy in the order presented below.

- USEPA Region 4 ESVs (USEPA, 2018b).
- USEPA Region 5 Ecological Screening Levels (USEPA, 2003a).

In the approved UFP-QAPP, USEPA Region 5 ESVs were selected for ESVs. However, Region 4 values were used as the primary source since they are more current.

Screening Risk Calculation

In this step, the maximum ECs detected in sediment and surface water were compared with the corresponding ESVs to derive screening level risk estimates. Detected chemicals were evaluated using the HQ method. HQs were calculated by dividing the MDCs by corresponding ESVs. Chemicals with HQs greater than or equal to 1 and that are site-related were identified as COPECs and carried forward for additional evaluation. Detected chemicals for which ESVs were not available were also carried forward.

Each COPEC was then subjected to a weight-of-evidence evaluation in order to place the results for the COPECs into proper context and make one of the following decisions: (1) NFA is warranted, (2) further evaluation is warranted, or (3) additional data are required. Weight-of-evidence topics can include site size, nutrient considerations, exposure considerations, frequency of detection, magnitude of HQ, conservativeness of the ESV, ecological significance and comparisons using measures of central tendency (UCL and/or mean) in place of the MDC.

The assumptions used in the SLERA have inherent uncertainty. While it is possible that this leads to underestimates of potential adverse effects, the use of upper-bound assumptions most likely results in conservative estimates of potential adverse effects. A receptor group's potential exposure and subsequent potential adverse effects are influenced by the exposure scenario and dose/response and vary on a case-by-case basis. The general uncertainties associated with the SLERA are provided in Table 4.3-2. Site-specific uncertainties associated with each site are provided in Section 5.

Recommendation for Scientific Management Decision Point 1

Following Step 2, the first scientific management decision point occurs. This scientific management decision point is intended to communicate the findings of the SLERA and to determine which COPECs, representative species, and exposure pathways should be carried forward to Step 3. The approach for Step 3 and the BERA are described in the final UFP-QAPP (CH2M, 2017) and the draft Watershed ERA.

SECTION 5

Site-Specific Remedial Investigation

This section summarizes site-specific background information and site physical characteristics, RI activities, and investigation results for seven IAAAP sites (IAAP-012G, IAAP-032G, IAAP-003-R-01, IAAP-005-R-01, IAAP-036G, IAAP-037G, and IAAP-039G) within five areas at the EDA (EBPs, WBPA, NBPs, NBPLF, and FTP; see Section 1.2.4). Each site-specific section begins on a new page and is followed by its tables and figures.

The media addressed in this OU-10 RI at each area of the EDA is summarized as follows:

- **East Burn Pads (EBPs) (IAAP-012G):** This RI report addresses groundwater at the EBPs area. Soil at the EBPs is addressed under the remedy for OU-1 (IAAP-012) (Leidos, 2018). Although a very small reach of Spring Creek flows inside the western boundary of the EBPs, surface water and sediment are evaluated at the WBPA (IAAP-032G) because it is the site within the EDA containing the largest portion of Spring Creek and perennial tributaries within its boundary.
- **West Burn Pad Area (WBPA) (IAAP-032G, IAAP-003-R-01, and IAAP-005-R-01):** This RI report addresses groundwater, surface water, and sediment at the WBPA. Soil at the WBPA is addressed under the remedies for OU-1 (IAAP-032) (Leidos, 2018).
- **North Burn Pads (NBPs) (IAAP-036G):** This RI report addresses groundwater at the NBPs. Soil at the NBPs is addressed under the remedy for OU-1 (IAAP-036) (Leidos, 2018). Although a very small reach of Spring Creek flows inside the western boundary of the NBPs, surface water and sediment are evaluated at the WBPA (IAAP-032G) because it is the site within the EDA containing the largest portion of Spring Creek and perennial tributaries within its boundary.
- **North Burn Pad Landfill (NBPLF) (IAAP-037G):** This RI report addresses groundwater at the NBPLF. Soil at the NBPLF is addressed under the remedy for OU-1 (IAAP-037) (Leidos, 2018). There are no perennial surface water features within the NBPLF.
- **Fire Training Pit (FTP) (IAAP-039G):** This RI report addresses groundwater at the FTP area. Soil at the FTP area is addressed under the remedy for OU-1 (IAAP-039) (Leidos, 2018). There are no perennial surface water features within the FTP.

In accordance with the final UFP-QAPP (CH2M, 2017), screening values used for site characterization differ from those that used in the risk assessments. The site characterization PALs were used to assess the distribution and nature and extent of chemicals whereas more conservative screening values will be used for risk assessment. The site characterization PALs are discussed in Section 4.1.1.

5.1 East Burn Pads—Groundwater (IAAP-012G)

This subsection summarizes RI activities at the EBPs site within the EDA. This report documents the RI for groundwater at the EBPs (IAAP-012G). Soil is addressed under the remedy for OU-1 (IAAP-012) (Leidos, 2018). A very small reach of Spring Creek flows inside the western boundary of the EBPs. However, Spring Creek flows adjacent to several environmental sites within the EDA (Figure 5.1-1). Surface water and sediment are evaluated at the WBPA (IAAP-032G) (Section 5.2) because it is the site within the EDA containing the largest portion of Spring Creek and perennial tributaries within its boundary.). A limited discussion of surface water and sediment within Spring Creek is included in this section to support the CSM for the EBPs.

5.1.1 Background

5.1.1.1 Site Description

The EBPs compose an inactive site located in the northeast portion of the IAAAP facility that covers approximately 12 acres within the Spring Creek watershed (Figure 5.1-1). The EBPs are part of a larger area, the EDA.

The EBPs area was used for demilitarization by open burning. The site is fenced and there are no remaining structures onsite. The EBPs previously contained eight raised earthen burning pads (Pads 1E through 8E) that were surrounded by earthen berms to restrict horizontal movement of projectiles, with one side open for access (JAYCOR, 1996). An igloo/bunker (BG-11) was formerly located approximately 200 feet southwest, in line with the former burn pads, and was likely used to view burning activities at the EBPs. In 1998, contaminated soil was removed from the burn pads and surrounding area (Figure 5.1-1) (ECC 2000). Following excavations, the surface was regraded to the base of the pervious berms, and a layer of topsoil and vegetation was placed on the final grade.

5.1.1.2 Operational History

The EBPs were active between 1949 and 1982 for operations that included open burning of explosives-contaminated metals, propellants, explosives, and pyrotechnic-contaminated materials. Available documentation does not indicate that petroleum fuels or other liquid accelerants were used for open burning operations. Explosive powder that was used to initiate the flashing was spread on top of materials placed on the burn pads. Live ordnance was not demilitarized (Tetra Tech, 2006). Scrap metal was recovered for offsite recycling, and ash and other debris were disposed of offsite. Operations at the EBPs ceased once the EWI was constructed in 1982.

5.1.1.3 Previous Investigations and Remedial Actions

Numerous investigations have been conducted at IAAAP since the 1980s. Table 5.1-1 summarizes the previous investigations and remedial actions conducted at the EBPs, including conclusions and recommendations. Although soil at EBPs has already been addressed under OU-1, previous investigations for soil are also presented in Table 5.1-1 to support the CSM.

This report summarizes the RI for groundwater at the EBPs (IAAP-012G). Previous investigations pertinent to the RI for groundwater are listed below; additional details on these investigations (including a more detailed description of work completed, as well as work not pertinent to this RI), are included in Table 5.1-1. Previous groundwater sampling locations are shown on Figure 5.1-2.

Investigation	Conclusion
Contamination Survey (ERG, 1982)	Two monitoring wells (G-29 [EBPs] and G-30 [WBPA]) were installed, and groundwater was sampled for explosives. Groundwater samples collected at the EBPs did not contain explosives. Two surface water samples were collected from Spring Creek and analyzed for explosives. No explosives were detected in the samples.
Follow-on Study of Environmental Contamination (Battelle, 1984)	Two surface water samples were collected from Spring Creek upstream and downstream of the EDA and analyzed for explosives. No contamination was found in surface water at the EDA. No additional recommendations were made for the EDA sites.
Groundwater Study at the EDA (Army Armament Munitions Command, as reported in JAYCOR, 1994; Dames and Moore, 1986)	Four monitoring wells (EDA-1 through EDA-4) were installed around the EBPs. Groundwater samples were collected from five monitoring wells at the EBPs between 1984 and 1986 and analyzed for explosives, VOCs, and/or metals. Elevated levels of RDX were detected in EDA wells EDA-2 and EDA-4.
RCRA Facility Assessment (Ecology and Environment, 1987)	Three sediment samples were collected from the EDA and analyzed for explosives and metals. Significant levels of explosives (RDX, HMX, 1,3,5-TNB, and TNT) were detected. High metals concentrations were found upgradient and downgradient of the site. Additional sediment sampling was recommended.
Facility-wide Preliminary Assessment (JAYCOR, 1994)	The Preliminary Assessment indicated there was a potential for contamination at the EBPs. It was recommended that the extent of contamination near the EBPs should be confirmed and surface water and groundwater contaminant migration investigated.
Facility-wide Site Inspection (JAYCOR, 1992)	Four groundwater samples were collected at the EDA during the SI and were analyzed for explosives, metals, VOCs, and SVOCs. Groundwater from all four monitoring wells contained explosives. Metals were detected in three monitoring wells, and elevated VOCs were detected in one well (EDA-2). No SVOCs were detected in groundwater. Further investigation was recommended as part of the RI.
Phase I and Follow-on Remedial Investigation (JAYCOR, 1993, 1996)	Five existing monitoring wells and two newly installed piezometers (R12-PZ-06 and R12-PZ-07) were sampled for metals, explosives, VOCs, SVOCs, and/or pesticides/PCBs during Phase I. Six additional monitoring wells were installed and sampled during Phase II and follow-on RI activities for VOCs, SVOCs, explosives, and metals. In groundwater, explosives and metals were the main contaminants observed at the EBPs. The RI recommended semiannual compliance groundwater monitoring at five wells in the EBPs for VOCs, SVOC, explosives, and metals. A soil removal action was identified as being in progress at the EDA. Surface water and sediment samples were collected from four locations along Spring Creek (RBW-SW/SD-07, -10, -14, and -16). No explosives, VOCs, or SVOCs were detected in upstream samples or in downstream. Metals were detected at low levels in all samples.
Periodic Groundwater and Surface Water Monitoring (multiple reports)	Periodic groundwater and surface water sampling were conducted at the EBPs between the 1994 and 2007 as part of the FFA compliance monitoring and groundwater monitoring program. Samples were analyzed for VOCs, SVOCs, explosives, metals, and/or natural attenuation parameters. Explosives, primarily RDX, were detected above comparison criteria in shallow monitoring wells and upper bedrock wells at the EBPs. TCE was consistently detected at one overburden monitoring well. Five metals (arsenic, barium, cadmium, lead, and manganese) exceeded screening criteria more than once in a given well at the EBPs. Monitoring data for the EBPs indicate concentrations of explosives and VOCs have decreased or are stable.

Investigation	Conclusion
Supplemental Groundwater Remedial Investigation (MWH, 2001)	In 1997, groundwater samples were collected from 11 existing monitoring wells and analyzed for VOCs, SVOCs, explosives, and metals. RDX, TCE, methylene chloride, and bis(2-ethylhexyl)phthalate (two locations) exceeded screening levels. However, methylene chloride and bis(2-ethylhexyl) phthalate were attributed to laboratory or sampling contamination. It was concluded that RDX contamination was present in both shallow and bedrock monitoring wells; however, no deeper wells were present in the area to provide vertical delineation.
Additional Monitoring Well Installation (Harza, 2000)	Two new bedrock monitoring wells and one new shallow overburden well were installed and added to the groundwater monitoring program. Natural attenuation and gross alpha and gross beta were also included as analyses for the EBPs monitoring well network.
Feasibility Study Data Collection (URS, 2004a)	Groundwater samples were collected from 22 DPT borings and analyzed for VOCs and/or explosives. Groundwater samples were also collected from three new bedrock monitoring wells and analyzed for explosives, metals, VOCs, SVOCs, and natural attenuation parameters. VOCs and explosives were detected in DPT groundwater samples. VOCs, SVOCs, and metals were detected in the monitoring wells. The shallow groundwater explosives plume consisted primarily of RDX and was identified to be present under a large portion of the EBPs. No groundwater contamination was detected in bedrock or deep till above the screening criteria. Risk assessments were conducted using the groundwater data collected during the Feasibility Study investigation and the groundwater and surface water data collected during the periodic compliance monitoring events. RDX was identified as a groundwater COC while there were no COCs identified for surface water. Groundwater flow and contaminant fate and transport models were developed. The models predicted that RDX concentrations in groundwater should continue to decline over time due to naturally occurring processes. The initial natural attenuation concluded that natural attenuation processes may be occurring in the EBPs RDX plume.
Comprehensive Watersheds Evaluation and Supplemental Data Collection Work Plan (Tetra Tech, 2006)	The work plan concluded that no groundwater, surface water, or sediment data gaps were present at the EBPs.

SI = site inspection
TCE = trichloroethene

As part of the previous investigations under OU-1, explosives, VOCs, SVOCs, pesticides, PCBs, and metals were identified as soil COCs for the EDA (ECC 2000). Elevated levels of explosives (mainly RDX) were identified in soil around former burn pads, with the highest concentrations around Pad 8E (ECC, 2000); the former burn pad locations are shown on Figure 5.1-1. To address risks and hazards associated with these COCs, soil removal actions have been conducted at EBPs, and LUCs have been implemented (Leidos, 2019); excavation areas are shown on Figure 5.1-1. Confirmation samples verified that all soil COCs had been removed to OU-1 remedial goals, with the exception of RDX. In the areas where RDX exceeded its leachability remedial goal (Pads 1E, 2E, 4E, 5E, 6E, and 8E), an additional 1 to 2 feet of soil excavation was conducted. The final excavations were completed to depths of 1 to 10 feet bgs. Approximately 12,670 cubic yards of contaminated soil was removed from excavations around the eight burn pads. The USEPA and USACE approved the backfilling of these excavation areas given that additional removal was conducted, contaminant concentrations were low, the remaining contamination was deep in the soil profile and would be covered with clean soil, human health and ecological risk would be minimal at the site, and removal of additional soil considering the contaminant depth and low risk potential was not cost-effective (USACE, 2016). No additional confirmation samples or excavations were required according to the USEPA representative Scott Marquess (ECC, 2000).

5.1.2 2018–2020 Remedial Investigation Activities

Additional field work was conducted at the EBPs to resolve data gaps needed to complete the RI for groundwater (IAAP-012G). As documented in the final *Site-specific Worksheets for Operable Unit 6 of the Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant (Packet 2*) (CH2M, 2018a), explosives and arsenic required further horizontal and vertical delineation, particularly in the western portion of the site, and an improved understanding of current conditions was warranted to complete the RI. To address these data gaps, the installation of six overburden monitoring wells and five bedrock monitoring wells was proposed along with groundwater sampling of nine existing wells and the newly installed monitoring wells. Fieldwork completed at the EBPs was conducted in accordance with the UFP-QAPP (CH2M, 2018a).

Surface water monitoring of Spring Creek was also warranted to assess potential groundwater and surface water interactions (CH2M, 2018a). This field work was conducted under the WBPA investigation and is discussed in Section 5.2.

5.1.2.1 2018–2019 Field Activities

Between June 10 and August 16, 2018, six new monitoring wells—one overburden monitoring well (EBP-MW15) and five new bedrock monitoring wells (EBP-MW7, EBP-MW9, EBP-MW13, EBP-MW16, and EBP-MW17)—were installed at the EBPs to meet the data quality objectives (Figure 5.1-2). Installation of five additional monitoring wells in overburden locations (EBP-MW8, EBP-MW10, EBP-MW11, EBP-MW12, and EBP-MW14) were attempted; however, these locations were dry, and no wells were installed. Proposed and newly installed monitoring wells are summarized below.

Station ID	Groundwater Unit	Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Rationale
EBP-MW7	Bedrock	62	45–55	To vertically delineate explosives near EDA-2.
EBP-MW8	Overburden	24.5	Dry, no well installed.	To horizontally delineate explosives and arsenic in overburden groundwater to the south-central portion of the RDX plume and downgradient of EBP-MW2 (arsenic).
EBP-MW9	Bedrock	61	50–60	To vertically delineate explosives and horizontally delineate arsenic in bedrock groundwater to the south-central portion of the RDX plume and downgradient of EBP-MW2 (arsenic).
EBP-MW10	Overburden	25	Dry, no well installed.	To horizontally delineate explosives in overburden groundwater south of the southwest lobe of the RDX plume.
EBP-MW11	Overburden	6 (refusal)	Dry, no well installed.	To horizontally delineate explosives in overburden groundwater west of the southwest lobe of the RDX plume.
EBP-MW12	Overburden	7 (refusal)	Dry, no well installed.	To horizontally delineate explosives in overburden groundwater north of the southwest lobe of the RDX plume.
EBP-MW13	Bedrock	62	50–60	To vertically delineate explosives southwest of the plume near EDA-2.

Station ID	Groundwater Unit	Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Rationale
EBP-MW14	Overburden	14	Dry, no well installed.	To horizontally delineate explosives in overburden groundwater northwest of the northwest lobe of the RDX plume near EBP-MW4.
EBP-MW15	Overburden	37	27–37	To horizontally delineate explosives in overburden groundwater to the north-centralportion of the RDX plume.
EBP-MW16	Bedrock	52	25–35	To vertically delineate explosives in bedrock groundwater northwest of the northwest lobe of the RDX plume near EBP-MW4.
EBP-MW17	Bedrock	51	40–50	To vertically delineate explosives in bedrock groundwater west of the southwest lobe of the RDX plume near EBP-MW5.

New monitoring wells were drilled via rotosonic drilling techniques with a MiniSonic drill rig and 6-inch drill rods (overburden) and wireline (bedrock) or with a Geoprobe 6620DT drill rig with 6- and 8-inch-outer-diameter augers (shallow overburden) in accordance with Section 3.2.3. Boring logs are provided in Appendix C. For monitoring well pairs, overburden lithology was logged only at the proposed overburden locations. All proposed overburden monitoring well locations were drilled to bedrock or refusal. Bedrock monitoring well locations were drilled to depths between 50 and 62 feet bgs, which is consistent with the UFP-QAPP (CH2M 2018a).

As summarized in the table above, groundwater was generally not present in the overburden at the EBPs, and only one new monitoring well (EBP-MW15) could be installed within this aquifer unit. In accordance with the UFP-QAPP, the overburden monitoring well (EBP-MW15) was screened across the perceived water table, just above bedrock. Well construction details are provided in Table 5.1-2. EBP-MW15 was completed with a 2-inch-nominal-diameter Schedule 40 PVC screen and riser and 0.5-foot Schedule 40 PVC end cap. The monitoring well was screened with a machine-slotted 0.010-inch, 10-foot screen. The monitoring well was constructed with a certified-clean silica sand filter pack from the base of the borehole to 2 feet above the top of the screen. A 3-foot-thick bentonite layer was placed above the filter pack sand and hydrated. The well was grouted to the surface, and a steel stickup well protector was installed and surrounded by three bollards. Well completion diagrams are included in Appendix C.

Bedrock monitoring well borings were cored up to 62 feet bgs to look for groundwater presence in the bedrock cores. Based on field observations (such as fracture frequency and moisture content), the bedrock wells were screened across intervals that were the most likely to produce groundwater. Once the screen interval was selected, the borings were reamed with 6-inch drill rods via sonic drilling techniques to the identified monitoring well depth. EBP-MW16 was overdrilled during reaming and was backfilled to 36 feet bgs with a bentonite seal following reaming activities. Well construction details are provided in Table 5.1-2. Bedrock monitoring wells were completed with a 2-inch-nominal-diameter Schedule 40 PVC screen and riser and 0.5-foot Schedule 40 PVC end cap. Bedrock monitoring wells were screened with a machine-slotted, 0.010-inch, 10-foot screen. Centralizers were installed at the base and just above the screened interval. Monitoring wells were constructed with a certified-clean silica sand filter pack from the base of the reamed borehole to 2 to 5 feet above the top of the screen. A 3- to 5-foot-thick bentonite layer was placed above the filter pack sand and hydrated. The well was grouted to the surface, and a steel stickup well protector was installed and surrounded by three bollards. Well completion diagrams are included in Appendix C.

In August 2018, newly installed monitoring wells were developed as described in Section 3.2.4. EBP-MW15 was developed on August 5, 2018, and EBP-MW7, EBP-MW9, EBP-MW13, EBP-MW16, and EBP-MW17 were developed on August 21, 2018. All monitoring wells were purged dry at least once. All EBP monitoring wells were considered developed due to the slow recharge. Well development logs are provided in Appendix C.

Groundwater samples were collected from 15 existing and newly installed monitoring wells between June 2018 and March 2019. Three existing monitoring wells (EBP-MW4, EBP-MW5, and EDA-4) were sampled between June 24 and July 12, 2018. Groundwater samples were collected for explosives by Method SW8330B. Newly installed monitoring wells (EBP-MW7, EBP-MW9, EBP-MW13, EBP-MW15, EBP-MW16, and EBP-MW17) were sampled between March 6 and 25, 2019. Additionally, six existing monitoring wells (EBP-MW2, EBP-MW3, EBP-MW6, EDA-1, EDA-2, and JAW-07) were sampled between March 6 and 8, 2019. All groundwater samples at the EBPs were sampled via low-flow purging and sampling techniques or by purging three casing volumes. Groundwater samples were collected for explosives by Method SW8330B. Groundwater samples from EBP-MW2, EBP-MW3, EBP-MW9, and EDA-2 were also collected for arsenic by Method SW6020A and groundwater samples from EBP-MW13 were also collected for VOCs by Method SW8260 to support VOC delineation at the WBPA (discussed further in Section 5.2). Purge logs are included in Appendix C. Data were managed and validated as discussed in Section 3.3. Laboratory reports are provided in Appendix B.

All IDW generated during activities (soil and purge water) was disposed of in accordance with management activities discussed in Section 3.2.9. Waste management documentation is provided in Appendix D.

Newly installed monitoring wells EBP-MW7, EBP-MW9, EBP-MW13, EBP-MW15, EBP-MW16, and EBP-MW17 were surveyed by Bruner, Cooper, and Zuck, Inc., licensed Iowa surveyors, on September 24, 2018, in accordance with the methods described in Section 3.2.7. Survey information is included in Appendix E.

5.1.2.2 Deviations and Follow-on Field Activities (2020)

The final UFP-QAPP (Packet 2) (CH2M, 2018a) proposed the installation of 11 new monitoring wells (four overburden/bedrock well pairs, two overburden monitoring wells, and one bedrock monitoring well) to delineate the explosives and arsenic plumes at the EBPs. However, due to the thinness of the overburden unit in this area of IAAAP and the lack of groundwater in the overburden, only one out of the six proposed overburden monitoring wells were installed, as detailed in Section 5.1.2.1. This did not impact the results of the RI since the lack of groundwater in the overburden provides the necessary conceptual site model information.

One existing monitoring well (JAW-06) could not be sampled because the well was damaged. Therefore, a replacement monitoring well, JAW-06R, was installed on May 12, 2020, approximately 5 feet northwest from former JAW-06. The replacement well was drilled via hollow-stem auger drilling techniques using a Geoprobe 8040DT drill rig with 6-inch-outer-diameter augers in accordance with methods described in Section 3.2.3. The boring was drilled to 28.5 feet bgs, a depth similar to the original well, JAW-06. The boring log is provided in Appendix C. Based on lithologic observations, JAW-06R was screened from 18 to 28 feet bgs. The replacement well was completed with a 2-inch-nominal-diameter Schedule 40 PVC screen and riser and 0.5-foot Schedule 40 PVC end cap. The monitoring well was screened with a machine-slotted, 0.010-inch, 10-foot screen. The monitoring well was constructed with a certified-clean silica sand filter pack from the base of the borehole to 2 feet above the top of the screen. A 3-foot-thick bentonite layer was placed above the filter pack sand and hydrated. The well was grouted to the surface, and a steel stickup well protector was installed and surrounded by three bollards. Well completion diagrams are included in Appendix C. The installation and sampling of replacement well JAW-06R did not impact the results of the RI since the location was among the proposed sample locations and was still able to be sampled using the newly installed well.

On June 4, 2020, newly installed replacement monitoring well JAW-06R was developed in accordance with methods described in Section 3.2.4. JAW-06R was purged dry after approximately four well casing volumes were extracted, and the well was considered developed due to the slow recharge. Well development logs are provided in Appendix C.

A groundwater sample was collected from the replacement well on June 10, 2020. Because only a limited amount of groundwater had reentered the well following well development due to slow aquifer recharge, the sample was collected using a well bailer instead of a pump. No groundwater parameters were collected during sampling. The groundwater sample was analyzed for explosives by Method SW8330B. Data were managed and validated as discussed in Section 3.3. Laboratory reports are provided in Appendix B.

All IDW generated during activities (soil and purge water) was disposed of in accordance with management activities discussed in Section 3.2.9. Waste management documentation is provided in Appendix D. Newly installed replacement monitoring well JAW-06R was surveyed by Bruner, Cooper, and Zuck, Inc., licensed Iowa surveyors, on June 2, 2020, in accordance with methods described in Section 3.2.7. Survey information is included in Appendix E.

5.1.3 Environmental Setting

5.1.3.1 Topography and Surface Water

The topography over most of the EBPs site consists of an elevated, relatively flat area that slopes to the southwest towards Spring Creek. In the northeast portion of the EBPs, the topography slopes to the east toward an intermittent tributary. Following the soil removal actions, the area of the former burns pads was regraded to the base of the pervious berms. Surface elevations at the EBPs range from 640 feet amsl at Spring Creek to approximately 690 feet amsl in the northeastern portion of the site. West of the EBPs, the landscape is dissected by Spring Creek, and the topography changes to a steeply sloping terrain (URS, 2004a).

Surface runoff from the majority of the EBPs is channeled into shallow, intermittent drainage ditches and flows west toward Spring Creek and south into a south-flowing ephemeral tributary of Spring Creek (Figure 5.1-1). Surface runoff from the northeastern portion of the site flows east and into the southeast-trending segment of an intermittent tributary of Spring Creek.

5.1.3.2 Geology and Hydrogeology

The geology of the EBPs consists of unconsolidated overburden overlying limestone and shale bedrock. The unconsolidated overburden consists of loess and glacial till. A clayey silt loess has been observed in some borings in this area up to depths of 4 to 6 feet bgs, overlying the glacial till (Tetra Tech, 2006). The glacial till has been characterized as a silty clay to sandy clay with fine- to medium-grained sand with localized discontinuous sand seams or lenses. In the vicinity of Spring Creek, to the west of the EPBs, the glacial till pinches out. The overburden is underlain by bedrock at depths ranging from 5 to 53 feet below bgs; however, two historical borings (EPB-MW2 and EBP-DP-02) identified depth to bedrock considerably deeper, at 143 and 99 feet bgs, respectively. Generally, bedrock is shallower on the west side of the EBPs toward Spring Creek. The bedrock consists of limestone and shale associated with the Warsaw Formation and possibly the upper portions of the Keokuk Limestone, and outcrops along the banks of Spring Creek, where the glacial till pinches out. At monitoring wells EBP-MW4 and EBP-MW5, installed near Spring Creek, the upper bedrock thickness measured approximately 15 to 20 feet, was moderately to highly weathered, and contained isolated voids; rock quality designations ranged between 60 and 70 percent. Below the weathered and fractured bedrock zone, the bedrock becomes more competent; for example, at EBP-MW6, the rock quality designation in the screened interval was 100 percent (URS, 2004a).

Groundwater at the EBPs is divided into two units, overburden and bedrock groundwater. As previously discussed, the glacial till (overburden) pinches out to the west and can be locally absent. It increases in thickness to the east since the interface between the overburden and bedrock is tilted, sloping towards the east. In addition, groundwater is generally present only in the overburden at the EDA where sand seams are present. As a result, groundwater can be absent from the overburden unit at the EDA. Where present, overburden groundwater is monitored by wells screened between approximately 7 and 143.5 feet bgs, and groundwater levels measured during this RI in 2019 ranged from 5 to 20 feet below top of casing (btoc) (Table 5.1-3). Historically, groundwater at the EBPs has ranged from less than 1 to approximately 35 feet bgs. Bedrock groundwater is monitored by monitoring wells screened between approximately 13 and 75 feet bgs, with groundwater levels ranging from approximately 11 to 32 feet btoc in 2019. The deepest bedrock well at the site is shallower than the deepest overburden well because the overburden thickness at this site is highly variable, and the bedrock outcrops out at the surface near the creek, as depicted in Figure 5.1-8. Therefore, depths and elevations cannot be used as an indicator of what geologic zone a well is screened in at the EDA. Groundwater flow in the upper, weathered, bedrock generally occurs in the fractures and voids contained in the rock while groundwater flow in the competent bedrock is limited (URS, 2004a).

Based on recent and historical groundwater gauging data, shallow groundwater generally flows southwest toward Spring Creek (Figure 5.1-3). In the northeastern portion of the site, groundwater flows more to the east, where the topography changes to slope eastward (Figure 5.1-3). Calculated horizontal hydraulic gradients were approximately 0.05 foot/foot (ft/ft) in the EBPs. Based on 2019 groundwater elevations, a downward vertical gradient of -0.13 ft/ft was observed at the well pair EDA-2 (bedrock well) and EBP-MW7 (interface well); groundwater elevations are provided on Table 5.1-3.

Hydraulic conductivities of overburden and bedrock groundwater have been estimated from slug tests. Hydraulic conductivity of shallow glacial till groundwater ranged from 0.0013 to 0.55 foot per day (ft/day), and calculated conductivities in deep till (EBP-MW2) ranged from 0.38 to 8.6 ft/day. Calculated conductivities of bedrock groundwater ranged from 0.00015 to 0.025 ft/day (URS, 2004a).

5.1.3.3 Groundwater–Surface Water Interaction

Historically, groundwater gauging data associated with the spring and fall 2006 gauging events, in which the surface water elevation of the creek was also evaluated, indicated a potential for groundwater discharge to surface water along Spring Creek at the EBPs. Groundwater elevations of two monitoring wells, EBP-MW4 (screened from 34.5 to 44.5 feet bgs) and EBP-MW5 (screened from 35 to 45 feet bgs), located about 300 feet from Spring Creek, were compared to the nearby elevations of Spring Creek. Water levels observed in 2006 at EBP-MW4 show that the water table was between 3 and 6 feet higher than the nearby elevation of Spring Creek. At EBP-MW5, the water levels showed that the water table ranged from 4 feet below to 5 feet above the nearby elevation of Spring Creek, indicating that groundwater periodically discharges to the reach of Spring Creek adjacent to the EBPs (Figure 5.1-3). In contrast, the May 2015 groundwater gauging data indicated that Spring Creek and its ephemeral tributary are losing water to groundwater. Therefore, groundwater–surface water interaction is likely dependent on the temporal variability in groundwater elevations. Figure 5.1-8 shows the intersection of Spring Creek with the potentiometric surface.

Between staff gauge installation in 2018 and the 2019 RI gauging event, the three new staff gauges (EDA-1 through EDA-3) were damaged, and accurate measurements could not be recorded during the sitewide gauging event. It is recommended that these staff gauges be repaired to obtain accurate measurements in the future.

5.1.4 Nature and Extent of Contamination

This subsection describes the nature and extent of groundwater contamination at the EBPs (Figures 5.1.4 and 5.1.5). Surface water and sediment data from the vicinity of the EBPs (Figure 5.1-6) is also discussed to support the fate and transport evaluation. Similarly, although soil has been addressed under OU-1, a summary of the soil COCs is discussed briefly to inform the CSM for potential groundwater contaminants.

The source of contamination at the EBPs is attributed to releases to the surface as a result of historical site operations, including open burning of metals, propellants, explosives, and pyrotechnic-contaminated materials (URS, 2004a). Incomplete combustion of explosives compounds and metals from ash released to soil may have leached into groundwater.

5.1.4.1 Groundwater

Groundwater samples have been collected at the EBPs since 1981. Twenty-three active monitoring wells are present at the EBPs. Ten of the wells are screened in the overburden to depths ranging from 15.5 to 143.5 feet bgs, one well is screened across the overburden bedrock transition zone from 12 to 27 feet bgs, and 12 are screened in bedrock at depths ranging from 13 to 75.1 feet bgs (Figure 5.1-1). Historical groundwater samples were analyzed for VOCs, SVOCs, PAHs, explosives, metals, PCBs, radionuclides, and pesticides/herbicides. No pesticides or PCBs were detected in historical groundwater samples, and PAHs have not been detected in groundwater sampled since 1992 at the EBPs. Based on historical site operations and COCs identified in soil, explosives, VOCs, and metals are considered chemicals of interest in groundwater at the EBPs.

Samples were collected from 16 monitoring wells during the most recent RI activities, between 2018 and 2020, and analyzed for explosives (Figure 5.1-4). Monitoring well EBP-MW13 was also analyzed for VOCs, and monitoring wells EBP-MW2, EBP-MW3, EBP-MW9, and EDA-2 were also analyzed for arsenic to address the data quality objectives. Table 5.1-4 summarizes the chemicals detected in groundwater between 2000 and 2020 sampling events at the EBPs. Summary tables of all the analytical results (including nondetects) from the 2018–2020 RI activities are provided in Appendix G. Summary tables of all historical analytical results from the EBPs are provided in Appendix H.

VOCs

Thirteen VOCs have been detected in groundwater at the EBPs since 2000 (Table 5.1-4). Of these, only TCE has exceeded the site characterization PAL at one location, JAW-06. However, while TCE was detected above its PAL in JAW-06 in 2000 and 2001, it was detected below its PAL (5 µg/L) in this same well during subsequent sampling events in 2002 through 2006. Downgradient monitoring well EBP-MW13 was sampled for VOCs during the 2018–2020 RI (Figure 5.1-5); the only VOC detected in the well was acetone at a concentration below its site characterization PAL. There have been no VOC exceedances in groundwater at the EBPs since 2001.

SVOCs

Ten SVOCs have been detected in groundwater at the EBPs since 2000 (Table 5.1-4). Of these, only bis(2-ethylhexyl)phthalate exceeded its site characterization PAL (6 µg/L). Exceedances were reported in 11 monitoring wells in 2000; however, during subsequent sampling events in 2001 and 2002, bis(2-ethylhexyl)phthalate was nondetect at all 11 of these locations. Bis(2-ethylhexyl)phthalate is a plasticizer that is used in many common products, including PVC, plastic syringes, and pipette tips. It is not known to have been used at IAAAP. Therefore, its historical presence is attributed to laboratory or sampling contamination.

Explosives

Between 2000 and 2020, eight explosives were detected at the EBPs (Table 5.1-4). During the most recent RI monitoring event (2018–2020), only RDX exceeded its site characterization PAL at four locations (EBP-MW3, EBP-MW4, EBP-MW5, and EDA-2), as shown on Figure 5.1.4. In previous sampling events in 2007 and 2008, RDX also exceeded its PAL in EDA-3 and EDA-4. Since 2007, RDX concentrations have been decreasing at all monitoring wells except EBP-MW4, where concentrations increased from

4.9 µg/L in 2007 to 47 µg/L in 2018, although concentrations at this location have fluctuated since 2003 (Figure 5.1-7). EDA-3 was not sampled in during the recent RI activities (2018–2020). The maximum RDX concentration was detected at EDA-2 (149 µg/L) in 1985, and in 2019 RDX concentrations at this location had decreased to 13 µg/L.

RDX is present predominantly in overburden across the EBPs. However, in the area where the overburden aquifer pinches out, groundwater is not present, and the overburden aquifer is absent. As previously discussed, attempted overburden monitoring wells were dry in the western portion of the site. Where groundwater is present in the overburden, the RDX plume vertically extends to approximately 25 feet bgs in this aquifer (Figures 5.1-8 and 5.1-9). Where the overburden pinches out, three bedrock monitoring wells were installed to delineate the plume along the western boundary; bedrock monitoring wells EBP-MW13, EBP-MW16, and EBP-MW17 were screened between 25 and 50 feet bgs. Out of these locations, RDX was detected only in EBP-MW16 (screened 25 to 35 feet bgs), at a concentration of 0.36 J µg/L, below the site characterization PAL, indicating the western edge of the RDX plume is adequately delineated. RDX concentrations were nondetect at EBP-MW15, EDA-1, JAW-06R, JAW-07, and EBP-MW9 to the north, east, and south of the RDX plume (Figure 5.1-4). RDX concentrations were also nondetect at EBP-MW2 and EBP-MW6, which are screened between approximately 65 and 143 feet bgs, providing vertical delineation.

Metals

Thirteen metals have been detected in groundwater at the EBPs since 2000; however, only chromium was detected above its site characterization PAL (100 µg/L) and BTV (31 µg/L). Chromium historically exceeded its PAL and BTV in one location, EBP-MW1, in 2000 (126 µg/L). However, during subsequent sampling events in 2000, 2001, and 2002, chromium was either not detected or detected below the PAL and BTV at this location.

Concentrations of some metals may be naturally elevated in the environment, and may not indicate a CERCLA-regulated release. Several metals (such as arsenic, chromium, and manganese) were detected at levels below their BTVs during the latest sampling events and are therefore considered to be naturally occurring in groundwater at the EBPs. Although cobalt does not have a BTV, its presence in groundwater is also not considered to be site-related. Cobalt was detected in two monitoring wells (JAW-06 and EDA-2) in the early 1990s; however, it was nondetect in the same wells during subsequent sampling events. In a more recent sampling event in 2006, cobalt was reported in one well (EBP-MW06) at a low concentration, of 3.8 B µg/L (Appendix H). The B qualifier indicates that cobalt was also detected in the associated method and/or calibration blank, and this monitoring well concentration is likely biased high. The lines of evidence indicate that cobalt in groundwater is not associated with a site release at the EBPs.

Radionuclides

Gross alpha and gross beta have been detected in groundwater samples collected at the EBPs. The highest activities were observed in former overburden well JAW-06 (gross alpha of 8.2 picocuries per liter [pCi/L] and gross beta of 11.5 pCi/L in December 1999) and bedrock well JAW-04 (gross alpha of 12.8 pCi/L and gross beta of 11 pCi/L in May 2000). All concentrations were below the gross alpha MCL (15 pCi/L) and gross beta MCL (50 pCi/L) (Table 5.1-4).

5.1.4.2 Sediment and Surface Water

There is a very small segment of Spring Creek that runs just inside the western boundary of the EBPs. Spring Creek also flows adjacent to the outside portions of the northwestern site boundary and the southwestern site boundary (Figure 5.1-1). This creek and its perennial tributaries are predominantly located within the WBPA, and therefore, these surface water features are discussed in more detail in Section 5.2. However, to support the CSM for the EBPs, the nature and extent of RDX in surface water and sediment samples that are near the EBPs are discussed in this subsection.

Figure 5.1-6 shows surface water and sediment samples that have been collected from the EDA for explosives analysis. During the 2018 to 2020 RI sampling event, explosives were collected upstream (EDA-SW03) and downstream (EDA-SW02) of the EBPs. RDX was not detected in any of the upstream or downstream surface water samples. As described above, RDX has also been delineated at the EBPs along the western site boundary, providing further evidence that groundwater contamination at the EBPs is not discharging to Spring Creek.

5.1.5 Fate and Transport

This section discusses the fate and transport of site-related chemicals of interest at the EBPs. This includes chemicals that were detected above both their site characterization PAL and BTV (if available) during the last sampling event that those chemicals were analyzed. In groundwater, the only potential site-related chemical of interest is RDX. Fate and transport characteristics for this chemical are described in Section 3.2.

The EBPs were formerly used for demilitarization by open burning. The site is fenced and is vegetated, with no remaining structures onsite. This site falls within the Spring Creek watershed (Figure 2-1), and Spring Creek runs along the western boundary of the site (Figure 5.1-1). Surface water drainage occurs through a number of intermittent drainage ditches that ultimately discharge to Spring Creek. The groundwater at the EBPs is divided into two units, overburden and bedrock groundwater. However, the overburden aquifer is absent along the western portion of the site where the overburden pinches out and bedrock outcrops at the surface. Groundwater levels measured in the overburden aquifer ranged from 5 to 20 feet bgs (Figure 5.1-3), although historically groundwater has ranged from less than 1 to approximately 35 feet bgs. Bedrock groundwater levels ranged from approximately 11 to 32 feet bgs in 2019.

The source of contamination at the EBPs is attributed to unintended releases to the surface as a result of historical site operations, including open burn operations. Contaminants in groundwater have been transported from the source release areas through advection and dispersion. Groundwater generally flows towards Spring Creek, however a component of groundwater in the northeastern portion of the site flows eastward (Figure 5.1-3). Hydraulic conductivity of the overburden geology ranged from 0.0013 to 0.55 ft/day during aquifer slug testing in 2003. Calculated conductivities of bedrock groundwater ranged from 0.00015 to 0.025 ft/day (URS, 2004a). The groundwater flow velocities at the EBPs were estimated on the basis of the aquifer slug tests' results. As expected, the groundwater flow velocities were slow and ranged from 0.4 to 5.9 feet/year in the shallow overburden and from 0.0016 to 25 feet/year in the bedrock. Vertical migration at the site is also limited by the generally tight clay lithology in the overburden.

Natural attenuation mechanisms that are potentially active at the EBPs were evaluated. Natural attenuation includes various physical, chemical, or biological processes that under favorable conditions act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. A weight-of-evidence approach was used for this evaluation.

- The primary line of evidence that attenuation is occurring at a site is reduction over time in contaminant concentrations or mass, or both. Explosives were only detected above their site characterization PALs in four overburden and shallow bedrock monitoring wells during the latest sampling events (EBP-MW3, EBP-MW4, EBP-MW5, and EDA-2). RDX concentrations in three out of the four wells have decreased since late 2007 (Figure 5.1-7). Historically, the highest concentrations of RDX were detected at overburden monitoring well EDA-2; however, concentrations have been decreasing at this location since approximately 2000 (Figure 5.1-7). This decrease in concentrations indicates that natural attenuation may be occurring in this source area well. However, increasing trends at EBP-MW4 and EDA-3, both located near the leading edge of the RDX plume, may be indicative of some plume migration. Nevertheless, the lack of RDX exceedances in the most downgradient wells (EBP-MW13, EBP-MW16, and EBP-MW17) and surface water samples indicate that any plume migration is slow and limited.

- Anaerobic daughter products of RDX were detected at the EBPs in 2018. Low levels (less than 5 to 16 J µg/L) of MNX, TNX, and DNX were detected at monitoring wells EBP-MW3, EBP-MW4, EBP-MW5, EDA-2, EDA-3, and EDA-4, providing evidence that anaerobic biodegradation of RDX is occurring at the EBPs.
- Water quality parameters can be used to evaluate whether the geochemical conditions are conducive to biodegradation. During the current RI, groundwater in the impacted monitoring wells in the RDX plume (EBP-MW3, EBP-MW4, EBP-MW5, and EDA-2) was observed to be under aerobic and oxidizing conditions. Dissolved oxygen (DO) concentrations were reported in groundwater between 0.77 and 4.04 mg/L, and oxidation-reduction potential (ORP) values were reported above generally +100 mV (Tables 5.1-5). pH values were relatively neutral (between 6 and 7), which is favorable for biological activity. Under these geochemical conditions, anaerobic biodegradation of explosives, particularly RDX, would be less favorable. Nevertheless, the presence of anerobic RDX daughter products (MNX, DNX, TNX) indicates that anaerobic biodegradation has occurred. RDX is also subject to abiotic degradation.

The physical natural attenuation processes are also likely helping to attenuate plume migration. While the RDX in groundwater has moderate solubility and relatively low sorption potential, it should be retarded somewhat, as it sorbs to the clay geology. The decreasing thickness, of the overburden aquifer in this western direction may also be a factor that is limiting plume migration. RDX has limited volatility (Table 4-1) and therefore is unlikely to volatilize into soil gas at the water table interface.

5.1.6 Human Health Risk Assessment

An HHRA was prepared for the EBPs to evaluate potential current and future health risks and hazards from exposure to chemicals in site groundwater. Soil media within the EBPs is not included in the HHRA, as it is not a component of this RI; soil is addressed under the remedy for OU-1 (IAAP-012) (Leidos, 2018). A brief summary of OU-1 soil COCs is provided in Section 5.1.1.3 and historical remedial activities for soil are presented in Table 5.1-1. Spring Creek runs along the boundary between the WBPA and the EBPs, and this perennial feature is further evaluated in Section 5.2.6, with the WBPA. The EBPs HHRA was conducted in accordance with the final UFP-QAPP (CH2M, 2017), with the exception of some deviations that were agreed to during meetings or correspondence with USACE and USEPA following approval of the final UFP-QAPP. The approach and method used to conduct the HHRA are provided in Section 4.3.1. This section presents the CEM for the EBPs and provides the results of the four-step evaluation process comprising the following:

- Data evaluation.
- Exposure assessment.
- Toxicity assessment.
- Risk characterization.

The results of the HHRA are used to determine if further action is warranted for groundwater at the EBPs.

5.1.6.1 Conceptual Exposure Model

A description of the EBPs, their operational history, previous investigations, and remedial actions are provided in Sections 5.1.1 and 5.1.2.

The EBPs is an inactive site. Demilitarization by open burning was performed at the EBPs site. The site is fenced, and there are no remaining structures onsite. The site is open to recreational activities, and hunting is permitted within the site boundary. Spring Creek runs along the boundary between the WBPA and the EBPs. Exposures to Spring Creek surface water and sediment are addressed in the WBPA HHRA, Section 5.2.6. There are no other perennial surface water features within the EBPs. Culverts are present at the site; therefore, potential groundwater exposures by future construction/utility workers are complete at the EBPs.

Groundwater is not currently being used as a potable water source, and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the EBPs is classified as Class IIB, a potential source of drinking water (USEPA, 1989). Therefore, the HHRA for the EBPs evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future residential exposures to groundwater.

There are no potentially complete exposure pathways under current site conditions. The following potential future human receptors were identified in the HHRA for the EBPs:

- **Future Site Workers.** Future site workers could contact groundwater based on its potential future use as a drinking water source at the EBPs and could be exposed to indoor air (that may be impacted by volatile chemicals migrating from groundwater) in buildings.
- **Future Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert located within the EBPs.
- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on potential future use as a drinking water source at the EBPs and could be exposed to indoor air (that may be impacted by volatile chemicals migrating from groundwater) in buildings.

As discussed in Section 4.3.1, potential exposures and risks and hazards to future site workers and construction/utility workers are estimated in the HHRA only if the estimated risks and hazards for a hypothetical residential scenario exceed acceptable risk levels and COCs are identified for a residential scenario. The human health CEM presenting potential exposure media, exposure points, receptors, and exposure routes is provided in Appendix A-2, Attachment 1 (Table 1), and depicted graphically on Figure 5.1-10.

5.1.6.2 Data Evaluation

Data Used in the HHRA

Historical groundwater samples collected from 2003 and 2005 to 2008 and recent groundwater samples from 2018 to 2020 were used in the HHRA for the EBPs. The groundwater samples collected in 2003 were analyzed for explosives, metals, PAHs (all nondetects), SVOCs, and VOCs; 2005 and 2006 samples were analyzed for explosives, metals, an SVOC (1,4-oxathione), and VOCs; 2007 and 2008 samples were analyzed for arsenic and RDX; 2018 and 2020 samples were analyzed for explosives; and 2019 samples were analyzed for explosives, arsenic, SVOCs (all nondetects), and VOCs. With the exception of six samples,[5] only metals, SVOC and VOC data from the 2003 to 2008 data were used in HHRA because more recent explosives data were available. As stated in the UFP-QAPP (CH2M, 2017), “Older data (i.e., data collected prior to 2012) may be used in the human health risk assessments if they are still representative of the site (i.e., groundwater flow is slow), chemicals have properties where there would not be a significant reduction in concentrations over time (e.g., metals), or data are conservative for site conditions.” The EBPs are no longer operational, as described in Section 5.1.1. Potential soil sources to groundwater have been remediated, as described in Section 5.1.1.3. Due to a lack of continuing sources, historical concentrations in groundwater are expected to have remained stable or even decreased due

[5] Explosives data from the following samples were included in the HHRA: EBP-MW1-20030528, G-29-20030531, JAW-04-20030530, JAW-05-20030531, JAW-614-20030601, and JAW-64-20030531.

to natural attenuation processes. Therefore, the assumptions in the final UFP-QAPP still hold. Samples collected prior to 2012 are considered representative of, or more conservative than, current conditions at the EBPs.

A total of 73 groundwater samples were used to evaluate potential exposures for both a potable use scenario and the VI pathway. The groundwater samples were not collected at multilevel wells; therefore, a separate data grouping (based on shallow groundwater only) was not used to evaluate the VI pathway. A summary of the number of chemicals analyzed and detected in groundwater is presented below:

Chemical Group	Number of Chemicals Analyzed	Number of Chemicals Detected
Explosives	17	6
Metals	23	18
PAHs	1	0
SVOCs	47	1
VOCs	65	7

Data groupings and samples included in the HHRA are described in Tables 5.1-6 and 5.1-7, respectively. The analytical data set used in the HHRA is included as Appendix A-2, Attachment 2. The groundwater sampling locations included in the HHRA are depicted on Figure 5.1-11.

Screening Results for Site-related Chemicals of Potential Concern and Naturally Occurring Chemicals

The approach and SLs used to select the COPCs (site-related COPCs or naturally occurring chemicals) are described in Section 4.3.1. The results of the COPC screening process for a hypothetical resident potentially exposed to groundwater are provided in Appendix A-2, Attachment 1 (Tables 2.1 and 2.2). The COPCs (site-related COPCs or naturally occurring chemicals) identified in site groundwater are summarized in the tables below.

Summary of COPCs for the EBPs—Site-Related

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Groundwater Used for Tap Water				
Future Hypothetical Resident	4-Amino-2,6-dinitrotoluene	1/22	0.32	0.32
	RDX	8/23	0.31	47
	Barium	14/14	44.9	612
	Cobalt	1/1	3.8	3.8
	TCE	2/20	2	3
Groundwater to Indoor Air via Vapor Intrusion				
Future Hypothetical Resident	TCE	2/20	2	3

Summary of COPCs for the EBPs—Naturally Occurring Chemicals

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Groundwater Used for Tap Water				
Future Hypothetical Resident	Arsenic	10/22	2.5	28
	Cadmium	1/14	0.36	0.36
	Chromium	4/14	0.76	14.9
	Manganese	1/1	84.9	84.9

5.1.6.3 Exposure Assessment

The EBPs is an inactive site, and no buildings are present. Demilitarization by open burning was performed at the EBPs site. The EBPs area is open to recreational activities, and hunting is permitted within the site boundary. There are no perennial surface water features within the EBPs; exposures to Spring Creek surface water and sediment are addressed in the WBPA HHRA. As previously discussed, groundwater is not being used as a potable water source; however, the HHRA for the EBPs evaluated potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future site worker and residential exposures to groundwater. Therefore, ingestion, dermal contact, and inhalation exposures to COPCs in groundwater were estimated for future hypothetical residents (and site workers, if applicable); inhalation exposures of COPCs in indoor air from vapor intrusion of groundwater were also evaluated at the EBPs. Culverts are located at the EBPs; therefore, potential ingestion, dermal contact, and inhalation exposures to shallow groundwater in a trench are complete for future construction/utility workers. As noted previously, risks and hazards for site workers and construction/utility workers are estimated only if the estimated risks or hazards for a hypothetical residential scenario exceed acceptable risk or hazard levels and COCs are identified for a residential scenario. The potential exposure pathways considered in the HHRA are included in Appendix A-2, Attachment 1 (Table 1) and on Figure 5.1-11. The following receptor scenarios were quantified in the HHRA for the EBPs:

- Future hypothetical residents (adult and child).
  - Groundwater (tap water) COPCs—ingestion, dermal contact, and inhalation of volatiles in household air.
  - Groundwater (vapor intrusion) COPCs—inhalation of volatiles in indoor air.

Risks and hazards for site workers and construction/utility workers were not quantified in the HHRA because the estimated risks and hazards for a hypothetical residential scenario did not exceed acceptable risk or hazard levels and COCs were not identified for a residential scenario.

In accordance with USEPA guidance *Determining Groundwater Exposure Point Concentrations, Supplemental Guidance* (USEPA, 2014b), groundwater EPCs are typically calculated based on the data collected in the core of a plume. One RDX plume is present at the EBPs (Figure 5.1-4). Seven monitoring wells (see Table 5.1-7) are located within the core of the plume; 34 groundwater samples are available in the HHRA dataset for the RDX plume. If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the RDX plume, the maximum detected concentration of the COPC in the sitewide groundwater data set was used.

For groundwater, where a sufficient number of samples and detected concentrations are available for COPCs, the UCL on the mean is selected as the EPC. For COPCs where fewer than eight samples or four detects were available, the maximum detected concentrations were selected as the EPCs. For 4-amino-2,6-dinitrotoluene, arsenic, barium, chromium, and TCE, the maximum detected concentrations were located outside of the RDX plume and were used as the EPCs. The groundwater EPCs used to estimate the chemical intakes for groundwater are provided in Appendix A-2, Attachment 1 (Tables 3.1 and 3.2).

The exposure factors used in the intake calculations for receptor scenarios are included in Appendix A-2, Attachment 1 (Tables 4.1 through 4.3). The primary references for the exposure factor values are the standard default exposure factors presented in the HHEM (USEPA, 2014a).

5.1.6.4 Toxicity Assessment

The oral toxicity values (CSFs and RfDs) and inhalation toxicity values (IURs and RfCs) used in the HHRA were obtained from the USEPA standard hierarchy of toxicity value sources (USEPA, 2003), as provided in Section 4.3.1. Noncancer toxicity values for the COPCs identified at the EBPs are provided in Appendix A-2, Attachment 1 (Tables 5.1 and 5.2). Cancer toxicity values for the COPCs are provided in Appendix A-2, Attachment 1 (Tables 6.1 and 6.2).

Two COPCs (chromium and TCE) were identified as acting with a MMOA. The ADAFs and exposure assumptions used to calculate adjusted intakes and exposure concentrations for chromium and TCE are provided in Appendix A-2, Attachment 1 (Table 4 Supplement).

5.1.6.5 Risk Characterization

The risk characterization for the EBPs was completed using a four-step process, as discussed in Section 4.3.1. The results of each step are discussed below.

Step 1: Total Combined Risks and Hazards from Site-related COPCs and Naturally Occurring Chemicals

Step 1 consists of calculating receptor-specific ELCRs and His that include contributions from both site-related COPCs and naturally occurring chemicals. The estimated risks and hazards for a hypothetical residential scenario are summarized below in Table 5.1-8.

Table 5.1-8. Summary of Total Combined Risk and Hazard Estimates for Site-related COPCs and Naturally Occurring Chemicals—IAAP-012G: East Burn Pads Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-2, Attachment 1	Exposure Medium	COPC/Chemical	East Burn Pads		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.1 and 9.1	Groundwater (Tap water)	4-Amino-2,6-dinitrotoluene	0.32	NA	0.1
			RDX	47	NA	0.4
			Arsenic	28	NA	3
			Barium	612	NA	0.1
			Cadmium	0.36	NA	0.1
			Chromium [c]	14.9	NA	0.2
			Cobalt	3.8	NA	0.4
			Manganese	84.9	NA	0.1
			Trichloroethene	3	NA	0.9
			Total HI (Groundwater—Tap Water):		**NA**	**5**
		Groundwater (Indoor Air—Vapor Intrusion)	Trichloroethene	0.7	NA	0.3

Table 5.1-8. Summary of Total Combined Risk and Hazard Estimates for Site-related COPCs and Naturally Occurring Chemicals—IAAP-012G: East Burn Pads Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-2, Attachment 1	Exposure Medium	COPC/Chemical	East Burn Pads EPC [b]	East Burn Pads ELCR	East Burn Pads HI
		Total HI (Groundwater—Tap Water and Indoor Air):			**NA**	**5**
Hypothetical Resident (Child)	7.2 and 9.2	Groundwater (Tap water)	4-Amino-2,6-dinitrotoluene	0.32	NA	0.2
			RDX	47	NA	0.6
			Arsenic	28	NA	5
			Barium	612	NA	0.2
			Cadmium	0.36	NA	0.2
			Chromium [c]	14.9	NA	0.3
			Cobalt	3.8	NA	0.6
			Manganese	84.9	NA	0.2
			Trichloroethene	3	NA	1.1
			Total HI (Groundwater—Tap Water):		**NA**	**8**
		Groundwater (Indoor Air—Vapor Intrusion)	Trichloroethene	0.7	NA	0.3
		Total HI (Groundwater—Tap Water and Indoor Air):			**NA**	**8**
Hypothetical Resident (Adult/Child Aggregate)	7.3 and 9.3	Groundwater (Tap water)	4-Amino-2,6-dinitrotoluene	0.32	NA	NA
			RDX	47	5E-05	NA
			Arsenic	28	5E-04	NA
			Barium	612	NA	NA
			Cadmium	0.36	NA	NA
			Chromium [c]	14.9	4E-04	NA
			Cobalt	3.8	NA	NA
			Manganese	84.9	NA	NA
			Trichloroethene	3	6E-06	NA
			Total HI (Groundwater—Tap Water):		**1E-03**	**NA**
		Groundwater (Indoor Air—Vapor Intrusion)	Trichloroethene	0.7	3E-08	NA
		Total HI (Groundwater—Tap Water and Indoor Air):			**1E-03**	**NA**

Notes:

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic His were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water)—µg/L; Groundwater (Indoor Air—Vapor Intrusion)—µg/m³

[c] Chromium was evaluated as hexavalent chromium in the HHRA.

µg/L = microgram per liter

µg/m³ = microgram per cubic meter

COPC = chemical of potential concern

ELCR = excess lifetime cancer risk

EPC = exposure point concentration

HI = hazard index

NA = not applicable

RME = reasonable maximum exposure

Step 2: Risk Characterization of Naturally Occurring Chemicals

Step 2 consists of calculation of receptor-specific ELCRs and His for naturally occurring chemicals. Four COPCs (arsenic, cadmium, chromium, and manganese) were identified as naturally occurring/or not site-related chemicals in site groundwater at the EBPs, as discussed in Section 5.1.4.2. The maximum detected concentrations of arsenic, cadmium, chromium, and manganese were less than their respective BTVs. The estimated risks and hazards for the naturally occurring chemicals in groundwater for a future hypothetical residential scenario are provided below in Table 5.1-9. The naturally occurring chemicals are not used to identify the final COCs for the EBPs and are not discussed further in the HHRA after this step.

Table 5.1-9. Summary of Risk and Hazard Estimates for Naturally Occurring Chemicals— IAAP-012G: East Burn Pads Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-2, Attachment 1	Exposure Medium	Chemical	East Burn Pads		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.4 and 9.4	Groundwater (Tap water)	Arsenic	28	NA	3
			Cadmium	0.36	NA	0.1
			Chromium [c]	14.9	NA	0.2
			Manganese	84.9	NA	0.1
			Total HI (Groundwater—Tap Water):		**NA**	**3**
Hypothetical Resident (Child)	7.5 and 9.5	Groundwater (Tap water)	Arsenic	28	NA	5
			Cadmium	0.36	NA	0.2
			Chromium [c]	14.9	NA	0.3
			Manganese	84.9	NA	0.2
			Total HI (Groundwater—Tap Water):		**NA**	**5**
Hypothetical Resident	7.6 and 9.6	Groundwater (Tap water)	Arsenic	28	5E-04	NA
			Cadmium	0.36	NA	NA

Table 5.1-9. Summary of Risk and Hazard Estimates for Naturally Occurring Chemicals— IAAP-012G: East Burn Pads Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-2, Attachment 1	Exposure Medium	Chemical	East Burn Pads		
				EPC [b]	ELCR	HI
(Adult/Child Aggregate)			Chromium [c]	14.9	4E-04	NA
			Manganese	84.9	NA	NA
			Total HI (Groundwater—Tap Water):		**1E-03**	**NA**

Notes:

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water)—µg/L

[c] Chromium was evaluated as hexavalent chromium in the HHRA.

µg/L = microgram per liter

COPC = chemical of potential concern

ELCR = excess lifetime cancer risk

EPC = exposure point concentration

HI = hazard index

NA = not applicable

RME = reasonable maximum exposure

Step 3: Risk Characterization of Site-related COPCs

Step 3 consists of calculating receptor-specific ELCRs and HIs associated with site-related COPCs. Two explosives, two metals, and one VOC were identified as site-related COPCs for groundwater at the EBPs. The estimated risks and hazards for site-related COPCs in groundwater for a hypothetical resident are provided below in Table 5.1-10.

Table 5.1-10. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-012G: East Burn Pads Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-2, Attachment 1	Exposure Medium	COPC	East Burn Pads		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.7 and 9.7	Groundwater (Tap water)	4-Amino-2,6-dinitrotoluene	0.32	NA	0.1
			RDX	47	NA	0.4
			Barium	612	NA	0.1
			Cobalt	3.8	NA	0.4
			Trichloroethene	3	NA	0.9
			Total HI (Groundwater—Tap Water):		**NA**	**2**
		Groundwater (Indoor Air—	Trichloroethene	0.7	NA	0.3

Table 5.1-10. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-012G: East Burn Pads Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

		Vapor Intrusion)				
				Total HI (Groundwater—Tap Water and Indoor Air):	**NA**	**2[c]**
Hypothetical Resident (Child)	7.8 and 9.8	Groundwater (Tap water)	4-Amino-2,6-dinitrotoluene	0.32	NA	0.2
			RDX	47	NA	0.6
			Barium	612	NA	0.2
			Cobalt	3.8	NA	0.6
			Trichloroethene	3	NA	1.1
				Total HI (Groundwater—Tap Water):	**NA**	**3[c]**
		Groundwater (Indoor Air—Vapor Intrusion)	Trichloroethene	0.7	NA	0.3
				Total HI (Groundwater—Tap Water and Indoor Air):	**NA**	**3[c]**
Hypothetical Resident (Adult/Child Aggregate)	7.9 and 9.9	Groundwater (Tap water)	4-Amino-2,6-dinitrotoluene	0.32	NA	NA
			RDX	47	5E-05	NA
			Barium	612	NA	NA
			Cobalt	3.8	NA	NA
			Trichloroethene	3	6E-06	NA
				Total HI (Groundwater—Tap Water):	**5E-05**	**NA**
		Groundwater (Indoor Air—Vapor Intrusion)	Trichloroethene	0.7	3E-08	NA
				Total HI (Groundwater—Tap Water and Indoor Air):	**5E-05**	**NA**

Notes:

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water)—µg/L; Groundwater (Indoor Air—Vapor Intrusion)—µg/m^3

[c] No target organ HIs exceeded 1.

µg/L = microgram per liter

µg/m^3 = microgram per cubic meter

COPC = chemical of potential concern

ELCR = excess lifetime cancer risk

EPC = exposure point concentration

HI = hazard index

NA = not applicable

RME = reasonable maximum exposure

Step 4: Final COC Determination

The total ELCRs and HIs estimated for groundwater based on a future hypothetical residential scenario (adult and child) did not exceed USEPA's acceptable risk range of 1×10^{-6} to 1×10^{-4} and target organ HI of 1. Therefore, no COCs were identified for groundwater at the EBPs, and the EBPs qualifies for an NFA decision for groundwater based on the results of the HHRA.

5.1.6.6 Uncertainty Analysis

The assumptions used in the HHRAs have inherent uncertainty. The general uncertainties associated with the HHRAs for the sites in this RI report are provided in Section 4.3.1. This section provides additional site-specific uncertainties associated with the HHRA for the EBPs that are not included in Section 4.3.1.

Total chromium was initially identified as a COPC in groundwater because the maximum detected concentration for total chromium exceeded the tap water RSL for hexavalent chromium. It is likely that some or all of the total chromium concentrations are in the trivalent chromium form. All of the groundwater chromium concentrations are less than the tap water RSL for trivalent chromium and the MCL and BTV for total chromium. Using the hexavalent chromium RSL to evaluate total chromium in the COPC selection process was a conservative approach in the HHRA. Total chromium was determined to be naturally occurring in groundwater at the EBPs.

Hazard estimates for 4-amino-2,6-dinitrotoluene could be over- or underestimated because screening RfDs were used in the risk calculations. As stated in the Provisional Peer-Reviewed Toxicity Value (PPRTV) documents for 4-amino-2,6-dinitrotoluene (USEPA, 2020c),

> It is inappropriate to derive a subchronic or chronic provisional RfD for 4-amino-2,6-dinitrotoluene. However, information is available which, although insufficient to support derivation of a provisional toxicity value, under current guidelines, may be of limited use to risk assessors… Users of screening toxicity values in an appendix to a PPRTV assessment should understand that there is considerably more uncertainty associated with the derivation of a supplemental screening toxicity value than for a value presented in the body of the assessment.

Chemicals that were 100 percent not detected in groundwater were not included in the COPC identification process; however, they were evaluated in a separate screening to determine whether elevated nondetected results were present in groundwater. The detailed analysis of the nondetected chemicals at the EBPs is provided in Appendix A-2, Attachment 3. In summary, five explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene, 3-nitrotoluene, and nitrobenzene), one metal (thallium), one PAH (naphthalene), 13 SVOCs, and 18 VOCs have DLs and/or RLs exceeding SLs at the EBPs. Although the DLs and/or RLs for these nondetected chemicals are greater than the SLs, based on the adequacy of DLs/RLs and comparison to historically detected chemicals in groundwater at IAAAP, further consideration of nondetected chemicals does not appear warranted in the EBPs HHRA.

5.1.6.7 Summary of HHRA

An HHRA was prepared for the EBPs to evaluate potential current and future health risks from exposure to chemicals in site groundwater. The EBPs is no longer active, and no buildings are present at the site. The site is open to recreational activities and hunting is permitted within the site boundary. However, the hunter/recreator is not evaluated in the HHRA because soil is addressed under OU1 (IAAP-012) (Leidos, 2018), and exposures to surface water and sediment in Spring Creek, which borders the EBPs, are addressed with the WBPA HHRA. No other perennial surface water or sediment is present at the EBPs.

The following potential future human receptors were identified in the HHRA for the EBPs:

- **Future Site Workers.** Future site workers could contact groundwater based on its potential future use as a drinking water source at the EBPs and could be exposed to indoor air (that may be impacted by volatile chemicals migrating from groundwater) in buildings.
- **Future Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert located within the EBPs.
- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on its potential future use as a drinking water source at the EBPs and could be exposed to indoor air (that may be impacted by volatile chemicals migrating from groundwater) in buildings.

Potential exposures and risks and hazards to future site workers and construction/utility workers were not estimated in the HHRA since estimated risks and hazards for a hypothetical residential scenario did not exceed acceptable risk and hazard levels and no COCs were identified for a residential scenario.

The COPCs (site-related COPCs or naturally occurring chemicals) identified in site groundwater are as follows:

- Groundwater (potable use):
  - Naturally occurring: arsenic, cadmium, chromium, and manganese.
  - Site-related: 4-amino-2,6-dinitrotoluene, RDX, barium, cobalt, and TCE.
- Groundwater (vapor intrusion): TCE.

The risk characterization for the EBPs was completed using a four-step process, as discussed in Section 4.3.1. Step 1 presents the total combined risks and hazards from site-related COPCs and naturally occurring chemicals, as summarized in Table 5.1-8. Step 2 presents the risks and hazards from naturally occurring chemicals, as summarized in Table 5.1-9. Step 3 presents the risks and hazards from site-related COPCs, as summarized in Table 5.1-10.

No unacceptable groundwater risks or hazards were identified in Step 3 for hypothetical residents. Therefore, in Step 4, no COCs were identified for groundwater at the EBPs, and the EBPs site qualifies for an NFA decision for groundwater based on the results of the HHRA.

5.1.7 Ecological Risk Assessment

The ERA for groundwater at the EBPs is presented herein, beginning with Step 1 of the ERA process (to determine whether there are complete exposure pathways). Soil at the EBPs is already addressed under the remedy for OU-1. Spring Creek runs just inside the western boundary of the site; surface water and sediment from this feature were evaluated during the watershed ERA (Appendix I). A summary of the ERA conclusions for Spring Creek are provided in the ERA for the WBPA (Section 5.2.7).

Groundwater is present onsite, but ecological receptors are not exposed directly to groundwater; nevertheless, groundwater is a transport medium, and contaminated groundwater has potential to migrate to and discharge to surface water bodies. There are ditches onsite for drainage purposes; these are not perennial water bodies and do not provide suitable habitat for ecological receptors. Furthermore, as previously noted, there is no connectivity between the ditch and groundwater. Other than the small portion of Spring Creek that runs through the EBPs (and is evaluated under the WBPA site), there is a lack of perennial surface water bodies on the EBPs. Therefore, the groundwater-to-surface-water exposure pathway is incomplete. There are no complete exposure pathways for ecological receptors on the site. Therefore, there are no adverse effects identified and no additional actions are required from an ecological perspective.

5.1.8 Conclusions and Recommendations

An RI was conducted for the EBPs to refine the nature and extent of contamination in groundwater from historical activities and assess for potentially unacceptable risk to human health and adverse effects to the environment. Analytical data available for groundwater at EBPs includes data for explosives, VOCs, SVOCs, PAHs, PCBs, pesticides, radionuclides, and metals. Of these, explosives, VOCs, and metals were identified as site-related chemicals of interest based on historical site operations and a comparison of concentration data to site characterization PALs and BTVs (See Section 4.1).

In groundwater, no VOCs or metals were detected above their site characterization PAL or BTV (if available) during the most recent sampling events. Only one explosive (RDX) was detected above its site characterization PAL, and concentrations have been decreasing between 2007 and 2020 at existing monitoring wells at the EBPs, except for EBP-MW4 and EDA-3. RDX groundwater contamination is present as one large plume, which exists primarily within the overburden aquifer. Increasing trends at these monitoring wells EBP-MW4 and EDA-3 may be indicative of some plume migration. However, the overburden aquifer is absent in the western portion of the site, where it pinches out and bedrock outcrops to the surface. Along with the slow groundwater flow velocity, this may be limiting the extent of plume migration. As such, no RDX exceedances have been observed in the most downgradient monitoring wells at the site. The RDX plume is considered to be laterally and vertically delineated.

The soil removal that was completed in 1999 is assumed to have removed the bulk of RDX contamination that could be a source to groundwater. Although initial confirmation sampling showed RDX concentrations above the OU-1 leachability-based RG (1.3 mg/kg) at Pads 1E, 2E, 4E, 5E, 6E, and 8E, an additional 1 to 2 feet of soil was excavated in these areas following the confirmation sampling. Because a second round of confirmation sampling was not conducted, it is unknown whether RDX concentrations in soil still exceeded the leachability goal at the EBPs.

An HHRA and an ERA were conducted to quantify potential risks and hazards to human health and the environment from exposure to contaminants at the EBPs. The following conclusions were made based on the risk assessments:

- The HHRA concluded that there are no unacceptable risks or hazards for hypothetical residents from exposure to groundwater at the EBPs.
- The ERA concluded that there are no adverse effects to ecological receptors identified and no additional actions are required from an ecological perspective.

Based on the results of the RI and risk assessments, NFA is warranted for groundwater at the EBPs. It is recommended that IAAP-012G be transferred to a new OU (OU-10), and NFA be presented as the preferred remedy in a Proposed Plan. In addition, it is recommended that staff gauges EDA-1 through EDA-3 be repaired to obtain accurate groundwater gauging measurements at the site in the future.

5.2 West Burn Pad Area—Groundwater (IAAP-032G)

This subsection summarizes RI activities at the WBPA site within the EDA. This report documents the RI for groundwater, surface water, and sediment at the WBPA (IAAP-032G). Soil at the WBPA is addressed under the remedies for OU-1 and OU-8 (IAAP-032) (Leidos, 2018; USACE and Dawson, 2021; USACE, 2019). Surface water and sediment are evaluated at the WBPA because it is the site within the EDA containing the largest portion of Spring Creek and perennial tributaries within its boundary. Surface water and sediment data from the WBPA were evaluated in the 2022 Watershed ERA (Appendix I) for the Spring Creek watershed, as described in Section 5.2.7.

Munitions and explosives of concern (MEC) and munitions constituents (MC) in soil and groundwater have also been considered under OU-5 (IAAP-003-R-01 and IAAP-005-R-01) (CB&I Federal Services, 2014). Because no MEC or evidence of munitions-related activities were identified at the WBPA, it was concluded that there were no impacts to groundwater from munitions-related activities. The OU-5 ROD documented that NFA is warranted for these two MMRP sites within the WBPA.

5.2.1 Background

5.2.1.1 Site Description

The WBPA composes a generally inactive site located in the northeast portion of the IAAAP facility that covers approximately 14 acres contained within the Spring Creek watershed (Figure 5.1-1). The WBPA is part of a larger area, the EDA.

The WBPA consists of several sites with documented environmental impacts (Figure 5.1-1). Originally, the WBPA (IAAP-032) only included the Burn Cages site. However, the site boundary was later expanded to incorporate the following historical sites: Burn Cage Ash Landfill (IAAP-033), West Burn Pads (WBPs) (IAAP-034), and the WBPs Landfill (IAAP-035). As a result, the IAAP-032 site identification now includes the former Burn Cages site, the Burn Cage Ash Landfill, the WBPs, and the WBPs Landfill. In addition, there are two MMRP (OU-5) sites that fall within the WBPA boundary (IAAP-032): the WBPs MRS (IAAP-003-R-01) and the West Burn Pads South of Road (WBPS) MRS (IAAP-005-R-01). The two MMRP sites have been addressed under the OU-5 ROD (CB&I, 2014).

The WBPA was used for demilitarization by open burning at the burn pads, which were constructed of earthen material, and burn cages, which were constructed of steel. The WBPs consisted of cleared ground with soil berm barriers. The former WBPs were located in the central and southern portions of the WBPA. Former site IAAP-034 consisted of two burn pads (Pad 1-W and Pad 2-W), each approximately 15 by 50 feet. To restrict horizontal movement of projectiles, earthen berms were constructed along three sides of each burn pad, with open access on one side. Burning operations were also performed within metal cages at the Burn Cages site, located immediately east of the Pad 1-W (Figure 5.1-1). The former Burn Cages site consisted of three cages, each measuring approximately 30 by 60 feet (Tetra Tech, 2006).

Ash waste material from the burning operations at WBPs and the Burn Cages site were disposed of at the WBP Landfill and Burn Cage Ash Landfill, respectively. The former WBP Landfill was located in the western portion of the WBPA (Figure 5.1-1) and measured approximately 200 by 300 feet. The former Burn Cage Ash Landfill was located in the eastern portion of the WBPA (Figure 5.1-1) and measured approximately 350 by 125 feet.

Two buildings are present at the WBPA: a wash-down building (BG-13) and an office building (Building 500-183) (Figure 5.1-1). As of July 2012, Building BG-13 remains active and is used to wash down explosives-contaminated equipment (Tetra Tech, 2012). When the WBPA was active, Building 500-183, also referred to as BG-1, was used as a break room for IAAAP employees, but it is now vacant and scheduled for demolition. An underground viewing bunker is still present near Building 500-183.

Additionally, a breached constructed sedimentation dam is present near the WBPA at the convergence of an unnamed tributary with Spring Creek.

5.2.1.2 Operational History

The WBPA was active between 1947 and 1982, with operations that included open burning demilitarization activities, and burning and disposal of dunnage. Open burning was performed on a variety of munitions debris and related materials including explosives-contaminated metals parts and inert and explosives-contaminated packaging. Of note is that lead azide was likely among the materials burned at the WBPA, and liquid Freon was used to reduce the sensitivity of lead azide at the IAAAP. Recoverable metal was segregated for offsite recycling and reuse subsequent to burning. Land disposal was performed at onsite landfills for other wastes from burning operations, including ash, paper, wood, and metal cans.

The Burn Cages site and Burn Cage Ash Landfill operated from 1949 to 1982. The burn cages were used to incinerate inert and explosives-contaminated packaging, and the landfill, where residual ash and residue were placed on the ground and covered with soil, was used for disposal.

The WBPS MRS operated between 1949 and 1982 to flash explosives-contaminated metal parts and store salvageable metal parts. The site was cleared of metal parts in 1997 (Tetra Tech, 2012). The WBPs Landfill operated between 1950 and 1975 and received residue and waste from the WBPs and the EBPs in addition to paper, wood, and metal cans. As with the Burn Cage Ash Landfill, waste material at the WBPs Landfill was placed on the ground surface and covered with soil. The WBPS reportedly contained two trenches used for approximately 1 year in the 1940s or 1950s for flashing of metals contaminated with explosives. An igniter box has been found at the MRS, which indicated the possibility of a former burn pad in the vicinity. The underground viewing bunker that was found near Building 500-183 had a periscope aimed directly at the WBPs (CB&I Federal Services, 2014).

The Atomic Energy Commission conducted activities at the WBPA between 1947 and 1975. In 1975, control of the area reverted to the IAAAP (USACE, 2006). A dam that was observed by USACE during a 2001 field investigation (ECC, 2003) may have been used during Atomic Energy Commission activities. The actual purpose and period of use of the dam is unknown, but it may have been used to impound surface water for treatment prior to discharge to Spring Creek (URS, 2004b). Burning and disposal operations at the WBPA ceased after the Explosive Waste Incinerator was constructed in 1982.

5.2.1.3 Previous Investigations and Remedial Actions

Numerous investigations have been conducted at IAAAP since the 1980s. Table 5.2-1 summarizes the previous investigations and remedial actions conducted at the WBPA, including conclusions and recommendations. Although soil at the WBPA has already been addressed under OU-1, previous investigations for soil are also presented in Table 5.2-1 to support the CSM.

This report summarizes the RI for groundwater, surface water, and sediment at the WBPA (IAAP-032G). Previous investigations pertinent to the RI for groundwater, surface water and sediment are listed below; additional details on these investigations (e.g., including a more detailed description of work completed, as well as work not pertinent to this RI), are included in Table 5.2-1. Previous groundwater, surface water, and sediment sampling locations are shown on Figure 5.1-2.

Investigation	Conclusion
Contamination Survey (ERG, 1982)	Two monitoring wells (G-29 [EBPs] and G-30 [WBPA]) were installed and sampled for explosives. Groundwater samples collected at the WBPA did not contain explosives. Two surface water samples were collected from Spring Creek and analyzed for explosives. No explosives were detected in the samples.

Investigation	Conclusion
Follow-on Study of Environmental Contamination (Battelle, 1984)	Two surface water samples were collected from Spring Creek, upstream and downstream of the EDA, and analyzed for explosives. No contamination was found in surface water at the EDA. No additional recommendations were made for the EDA sites.
Midwest Site Confirmatory Study (Dames and Moore, 1986)	Groundwater samples were collected from the one monitoring well at the WBPA (G-30) and analyzed for explosives, VOCs, and metals. Two surface water samples were collected from Spring Creek, upstream and downstream of the EDA and analyzed for explosives, metals, and VOCs. No explosives or VOCs were detected in groundwater at the WBPA. Copper was detected in several EDA wells, including G-30; however, no other metals were detected at G-30. In surface water, one explosive was detected upstream and metals were detected in both upstream and downstream samples. No VOCs were detected in surface water around the EDA.
RCRA Facility Assessment (Ecology and Environment, 1987)	Three sediment samples were collected from the EDA and analyzed for explosives and metals. Significant levels of explosives (RDX, HMX, 1,3,5-TNB, and TNT) were detected. High metals concentrations were found upgradient and downgradient of the site. Heavy metals concentrations upgradient and downgradient of the open burning pit were high. Additional sediment sampling was recommended.
Facility-wide Preliminary Assessment (JAYCOR, 1994)	The Preliminary Assessment indicated there was a potential for contamination at the WBPA. It was recommended that soil, surface water, and sediment samples should be collected at the WBPA.
Facility-wide Site Inspection (JAYCOR, 1992)	Three sediment samples were collected at the EDA during the SI and were analyzed for explosives, metals, and VOCs. No groundwater samples were collected at the WBPA during the SI. Metals and explosives were detected in sediment at the WBPA. Further investigation was recommended as part of the RI.
Phase I and Follow-on Remedial Investigation (JAYCOR, 1993, 1996)	No groundwater sampling was conducted during the Phase I RI. Four new monitoring wells and one existing monitoring well at the WBPA were sampled for explosives and metals during Phase II. During follow-on work, all monitoring wells were also sampled for VOCs and explosives. In groundwater, explosives and metals were the main contaminants observed at the WBPA, and VOCs were detected during the follow-on sampling. The RI recommended semiannual compliance groundwater monitoring at one wells in the WBPA for VOCs, explosives and metals. Surface water and sediment samples were collected from four locations along Spring Creek (RBW-SW/SD-07, -10, -14, and -16). No explosives, VOCs, or SVOCs were detected in upstream samples or in downstream. Metals were detected at low levels in all samples.
Periodic Groundwater and Surface Water Monitoring (multiple reports)	Periodic groundwater and surface water sampling was conducted at the WBPA between the 1994 and 2007 as part of the FFA compliance monitoring and groundwater monitoring program. However, groundwater samples were collected only until 2004, after which groundwater was removed from the sampling program because of a treatability study. Samples were analyzed for VOCs, SVOC, explosives, metals, radionuclides, and/or natural attenuation parameters. Explosives, primarily RDX, were detected above comparison criteria in shallow monitoring wells and upper bedrock wells at the WBPA. RDX concentrations above 100 µg/L were confined to the southeastern portion of the site.

Investigation	Conclusion
Supplemental Groundwater Remedial Investigation (MWH, 2001)	In 1997, groundwater samples were collected from eleven existing monitoring wells at the EDA and analyzed for VOCs, SVOCs, explosives, and metals. Explosives (RDX, HMX, 1,3-5-TNB, and TNT) and metals (lead, cadmium, and barium) exceeded screening levels at least one of three locations (JAW-23, JAW-24, and JAW-25). The maximum concentration of RDX was detected at bedrock well JAW-23 (6,900 µg/L). No VOCs and SVOCs were detected above screening levels at the WBPA monitoring wells. It was concluded that RDX contamination was present in both shallow overburden wells and bedrock; however, no deeper wells were present in the area to provide vertical delineation.
Additional Monitoring Well Installation (Harza, 2000)	Five new bedrock monitoring wells and two new shallow overburden wells were installed at the WBPA and added to the groundwater monitoring program.
Feasibility Study Data Collection (URS, 2003, 2004b)	Groundwater samples were collected from 21 DPT borings and analyzed for explosives and VOCs. Groundwater samples were also collected from three new bedrock monitoring wells and analyzed for explosives, metals, VOCs, and natural attenuation parameters. Eight surface water samples were collected and analyzed for VOCs, explosives, and metals. VOCs and explosives were detected in DPT groundwater samples. Explosives, VOCs, metals, and nitrate were detected above screening levels at the WBPA. No groundwater contamination was detected in bedrock above the screening criteria. RDX and Freon 113 were selected as the main COPCs in groundwater at the WBPA. Risk assessments were conducted using the groundwater data collected during the Feasibility Study investigation and the groundwater and surface water data collected during the periodic, compliance, monitoring events. Bromodichloromethane, TCE, 2,4-DNT, 2,6-DNT, RDX, and arsenic were identified as groundwater COCs at the WBPA, while there were no COCs identified for surface water. Groundwater flow and contaminant fate and transport models were developed. The models predicted that RDX concentrations in groundwater should continue to decline over time due to naturally occurring processes. The modeling also indicated high RDX concentrations on the north side of the WBPA are impacting Spring Creek and RDX concentrations above 2 µg/L may be impacting the tributary for another 20 to 25 years. The initial natural attenuation concluded that natural attenuation processes may be occurring in the WBPA RDX plume, while wells with Freon 113 appeared to contribute to a more reductive, anaerobic environment.
Comprehensive Watersheds Evaluation and Supplemental Data Collection Work Plan (Tetra Tech, 2006)	The work plan concluded that no groundwater, surface water, or sediment data gaps were present at the EBPs.
Groundwater Treatability Study (Tetra Tech, 2010)	A two-phase groundwater treatability study was conducted at the WBPA to test the efficacy of in situ bioremediation at reducing the highest level of mixed VOC and explosives contamination (Freon-113 and RDX). High-fructose corn syrup solutions were injected into 24 DPT injection points between 2005 and 2008. Two RDX hot spots were targeted, in the northwest and southeast of the WBPA. Ten monitoring wells were monitored during the study. It was concluded the addition of a carbon amendment enhanced the natural degradation process of explosives in groundwater at the WBPA; however, due to the presence of source material at the time of the study, had little impact on the RDX contamination in the southeast hot spot.
OU-5 RI, MMRP (URS, 2011)	Visual survey and surface clearance activities were conducted. Because no MEC or evidence of munitions-related activities were identified at the WBP MRS or the WBPS, sampling for MC in soil and groundwater was not warranted at either of the munition sites under the MMRP.

As part of the previous investigations under OU-1, explosives, VOCs, SVOCs, pesticides, PCBs, and metals were identified as soil COCs for the EDA (ECC 2001). Elevated levels of explosives (mainly RDX) and metals (barium and lead) were identified in soil around former burn pads, burn cages, and the WBP Landfill and Burn Cages Ash Landfill (ECC 2001); the former burns pad and landfill locations are shown on Figure 5.1-1. To address risks and hazards associated with these COCs, soil removal actions have been conducted at the WBPA and LUCs have been implemented (Leidos, 2019); excavation areas are shown on Figure 5.1-1. Soil removals have been conducted under the IRP and FUSRAP.

In 2000 under the IRP, approximately 46,496 cubic yards of contaminated soil were removed from the WBPA. In the excavation areas where the soil was removed down to bedrock, sand backfill and a geotextile fabric were placed on top of the rock. The entire area was backfilled with clean clay fill. Confirmation samples collected in 2000 from excavations indicated that RDX was still present above OU-1 leachability RGs at four of the excavation areas (WBP Landfill, Pad 2-W, Burn Cage Ash Landfill, and Pad 1-W) (Tetra Tech, 2012). No further excavation was required because bedrock was encountered and/or due to the low levels of explosives (ECC, 2001).

Additional excavations were conducted under FUSRAP from 2009 to 2010 to remediate explosives and metals at the WBPS (USACE and Dawson, 2021). During this removal action, an estimated 19,050 cubic yards of contaminated soil was removed from the WBPS. Confirmation samples demonstrated that RGs were met at the WBPS and no additional remedial actions were proposed for soil at the WBPA (USACE and Dawson, 2021). The final inspection was performed at the WBPS in 2012 and all areas were certified as “construction complete.”

During the OU-5 RI, no MEC was recovered at the WBPA, and only one piece of munitions debris was recovered. The OU-5 ROD documented that there is no action necessary to address MEC or MC in soil or groundwater for the MMRP sites, the WBP MRS (IAAP-003-R-01) and the WBPS MRS (IAAP-005-R-01) (CB&I, 2014).

5.2.2 2018–2020 Remedial Investigation Activities

Additional field work was conducted at the WBPA to resolve data gaps needed to complete the RI for groundwater (IAAP-032G). As documented in the final *Site-specific Worksheets for Operable Unit 6 of the Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant (Packet 2*) (CH2M, 2018a), explosives, VOCs, and metals in groundwater required further horizontal and vertical delineation, and an improved understanding of current conditions (including groundwater–surface water interactions) was warranted to complete the RI. To address these data gaps, the installation of three overburden monitoring wells and three bedrock monitoring wells was proposed along with groundwater sampling of 26 existing WBPA wells and the newly installed monitoring wells. Groundwater samples were also proposed from four newly installed wells at the EBPs (Section 5.1) and from four existing wells at the NBP (Section 5.3). Five surface water samples were proposed to evaluate surface water contamination upstream and downstream of the EDA. Two staff gauges were also proposed along with two monitoring events (during high-water-level and low-water-level periods) to evaluate whether the tributary and creek was gaining or losing. Fieldwork completed at the WBPA was conducted in accordance with the UFP-QAPP (CH2M, 2018a).

5.2.2.1 2018-2020 Field Activities

Between May 11 and August 2, 2018, three new monitoring wells were installed at the EBPs. The three new bedrock monitoring wells (WBP-MW6, WBP-MW8, WBP-MW9) were installed in 2018 to meet the data quality objectives. Well locations are shown on Figure 5.1-2. Installation of three additional overburden locations (WBP-MW4, WBP-MW5, and WBP-MW7) were attempted; however, locations were dry (that is, groundwater is not present in the overburden in this area of IAAAP), and no wells were installed. A summary of the proposed and newly installed monitoring wells is provided below.

Station ID	Groundwater Unit	Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Rationale
WBP-MW4	Overburden	12.5	Dry, no well installed.	To delineate COPCs north of WBP-DP20.
WBP-MW5	Overburden	5.5	Dry, no well installed.	To delineate RDX south of eastern RDX hot spot.
WBP-MW6	Bedrock	46.5	29–39	To horizontally delineate COPCs at WBP-99-6 to the west.
WBP-MW7	Overburden	6.4	Dry, no well installed.	To horizontally delineate COPCs north of WBP-99-6, WBP-DP05, and WBP-TTMW-05B.
WBP-MW8	Bedrock	42	32–42	To horizontally delineate COPCs to the south of WBP-99-6.
WBP-MW9	Bedrock	82	70–80	To vertically delineate COPCs at WBP-99-6.

New monitoring wells were drilled via rotosonic drilling techniques with a MiniSonic drill rig and 6-inch drill rods (overburden) and wireline (bedrock) or with a Geoprobe 6620DT drill rig with 6- and 8-inch-outer-diameter augers (shallow overburden) in accordance with Section 3.2.3. Boring logs are provided in Appendix C. All proposed overburden monitoring well locations were drilled to bedrock or refusal. Bedrock monitoring well locations were drilled to depths between 42 and 82 feet bgs, which is consistent with the UFP-QAPP (CH2M, 2018a).

As summarized in the table above, groundwater was not present in the overburden at the WBPA, and no proposed overburden monitoring wells could be installed within this aquifer unit. Bedrock monitoring well borings were cored up to 82 feet bgs to look for groundwater presence in the bedrock cores. Based on field observations (such as, fracture frequency and moisture content), the bedrock wells were screened across intervals that were the mostly likely to produce groundwater. Once the screen interval was selected, the borings were reamed with 6-inch drill rods via sonic drilling techniques to the identified monitoring well depth. Well construction details are provided in Table 5.1-2. Bedrock monitoring wells were completed with a 2-inch-nominal-diameter Schedule 40 PVC screen and riser and 0.5-foot Schedule 40 PVC end cap. Bedrock monitoring wells were screened with a machine-slotted, 0.010-inch, 10-foot screen, except for WBP-MW9. Monitoring well WBP-MW9 was completed with a wire-wrapped stainless-steel screen due to its depth (> 80 feet) within the bedrock aquifer. Bedrock fractures decrease with depth at IAAAP and using a wire-wrap screen provides a larger surface area to contact the more limited fractures at depth. Centralizers were installed at the base and just above the screened interval. Monitoring wells were constructed with a certified-clean silica sand filter pack from the base of the borehole to 2 feet above the top of the screen. A 5-foot-thick bentonite layer was placed above the filter pack sand and hydrated, except at WBP-MW6 where a 23-foot-thick bentonite layer was placed. The wells were grouted to the surface, and a steel stickup well protector was installed and surrounded by three bollards. Well completion diagrams are included in Appendix C.

Three staff gauges (Staff Gauge EDA-1 through Staff Gauge EDA-3) were installed on August 18 and 19, 2018, within Spring Creek and its tributaries (Figure 5.1-3). Staff Gauge EDA-1 was installed within the WBPA northern tributary, Staff Gauge EDA-2 was installed within Spring Creek in the central western portion of the WBPA, and Staff Gauge EDA-3 was installed within the NBPLF northern tributary.

On August 20, 2018, newly installed monitoring wells (WBP-MW6, WBP-MW8, and WBP-MW9) were developed as described in Section 3.2.4. Groundwater sampling was attempted at monitoring well WBP-MW6, in March 2019; however, it was noted this location required additional well development. WBP-MW6 was redeveloped on December 19, 2019, and was sampled via low-flow sampling techniques on

May 7, 2020. All monitoring wells were purged dry at least once. All WBPA monitoring wells were considered developed due to the slow recharge. Well development logs are provided in Appendix C.

A sitewide (EDA) groundwater survey was completed on March 3, 2019. Following this sitewide gauging event, groundwater samples were collected from 29 existing and newly installed monitoring wells between March 2019 and May 2020 (Tables 5.1-3 and 5.2-2). Twenty-five existing monitoring wells (G-30, WBP-TTMW-10 through WBP-TTMW-15, JAW-23 through JAW-25, WBP-99-1 through WBP-99-6, and WBP-MW1 through WBP-MW3) and two new monitoring wells (WBP-MW8 and WBP-MW9) were sampled via low-flow purging and sampling techniques between March 3 and 24, 2019. Existing monitoring well JAW-68 was sampled on December 19, 2019. Groundwater samples were collected for explosives by Method SW8330B, VOCs by Method SW8260, and/or RCRA metals by Method SW6020A. Purge logs are included in Appendix C. Data were managed and validated as discussed in Section 3.3. Laboratory reports are provided in Appendix B.

On March 12 and 19, 2019, four surface water samples were collected from Spring Creek and its tributaries at the EDA. Surface water samples EDA-SW04 and EDA-SW02 were collected from Spring Creek, upstream and downstream of the EDA, respectively. Surface water samples collected upstream and downstream of the EDA were analyzed for explosives by Method SW8330B, VOCs by Method SW8260, and total and dissolved Target Analyte List metals by Method SW6020A. One surface water sample, EDA-SW01, was collected from the intermittent tributary along the southern boundary of the WBPA, downgradient of G-30, and one surface water sample, EDA-SW03, was collected downstream of EDA-SW04 and downstream of the NBPLF and were analyzed for explosives by Method SW8330B. A fifth surface water sample was attempted at the intermittent tributary northeast of the NBPLF; however, this tributary was dry and no samples were collected.

All IDW generated during activities (soil and purge water) was disposed of in accordance with management activities discussed in Section 3.2.9. Waste management documentation is provided in Appendix D.

The three newly installed monitoring wells WBP-MW6, WBP-MW8 and WBP-MW9 and the three newly installed Staff Gauges EDA-1 through EDA-3 (3-foot marker) were surveyed by Bruner, Cooper, and Zuck, Inc., licensed Iowa surveyors, on September 24, 2018, in accordance with Section 3.2.7. Survey information is included in Appendix E. Nine existing monitoring wells (WBP-TTMW-01 through WBP-TTMW-04, WBP-TTMW-05B, WBP-TTMW-06, WBP-TTMW-08, WBP-TTMW-10, and WBP-TTMW-11) were resurveyed on December 17, 2019, since top-of-casing elevation data were not available for these wells.

5.2.2.2 Deviations and Follow-on Field Activities (2020)

The final *Site-specific Worksheets for Operable Unit 6 of the Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant, Middletown, Iowa* (Packet 1) (CH2M, 2017b) proposed the installation of six new monitoring wells (three overburden wells and three bedrock monitoring wells) to delineate the COPC plumes at the WBPA. However, due to the thinness of the overburden unit in this area of IAAAP and the lack of groundwater in the overburden, proposed overburden monitoring wells were not installed, as detailed in Section 5.2.2.1. This did not impact the results of the RI since the lack of groundwater in the overburden provides the necessary conceptual site model information.

One proposed overburden location (WBP-MW5) was not accessible during the 2018 or 2019 drilling events, as it required a Missouri-style crossing over a tributary in the south of the WBPA. In early 2020, this location was re-assessed, and it was determined that the tributary was dry enough to access with a track-mounted rig. Therefore, WBP-MW5 was attempted on May 11, 2020. This location was drilled via hollow-stem auger drilling techniques using a Geoprobe 8040DT drill rig with 6-inch-outer-diameter augers in accordance with Section 3.2.3. The boring was drilled to refusal at 5.5 feet bgs. The boring log is provided in Appendix C. This location was dry and due to the thin overburden present, the borehole was subsequently abandoned, and no well was installed. This did not impact the results of the RI since the lack of groundwater in the overburden at this location provides the necessary conceptual site model information.

Staff Gauges EDA-1 through EDA-3 could not be located during the 2019 and 2020 activities and likely had been destroyed. This did not impact the results of the RI since previous data can be used to infer that the creek is a gaining surface water body. In addition, surface water sample data can also be used to assess fate and transport of contamination.

5.2.3 Environmental Setting

5.2.3.1 Topography and Surface Water

The topography of the WBPA site ranges from 630 feet to 680 feel amsl and slopes eastward towards Spring Creek and northward toward an unnamed tributary of Spring Creek that defines the northern boundary of the site. In the northeast portion of the WBPA, surface runoff follows topography and flows generally toward Spring Creek and the unnamed tributary along the northern boundary of the WBPA. In the southern portion of the site, surface water is channeled into ditches along the road between the former burn pads and WBPS and discharges to Spring Creek (Figure 5.1-3).

5.2.3.2 Geology and Hydrogeology

The geology of the WBPA consists of unconsolidated overburden overlying limestone and shale bedrock. The unconsolidated overburden consists of loess and glacial till. A clayey silt to silt loess has been observed in some borings in this area up to depths of 3 to 6 feet bgs, overlying the glacial till. The glacial till has been characterized as a silty clay to sandy clay with fine- to medium-grained sand with localized discontinuous sand seams or lenses. Thickness of the overburden generally ranges from 2 to 35 feet; however, overburden soil pinches out near Spring Creek and bedrock is exposed (Tetra Tech, 2012). The overburden is thickest at WBP-99-5, which is located in the north-central portion of the WBPA (Figure 5.1-2). During the recent RI, bedrock was encountered between 5.5 and 12.5 feet bgs in newly drilled locations. The upper bedrock consists of the weathered Warsaw Formation shale and limestone underlain by the more competent Keokuk Limestone.

At new bedrock monitoring wells installed near Spring Creek, the upper bedrock thickness measured approximately 15 to 25 feet and was moderately to highly weathered, contained isolated voids, and rock quality designations ranged between 40 and 80 percent. Below the weathered and fractured bedrock zone, the bedrock becomes more competent; for example, at WBP-MW8, the rock quality designation in the screened interval was up to 100 percent.

Groundwater at the WBPA is divided into two units, overburden and bedrock groundwater. Historically, overburden groundwater occurs at depths ranging from approximately 1.5 to approximately 23 feet bgs, and bedrock groundwater occurs at depths ranging from artesian to 45 feet bgs. During the 2019 RI gauging event, groundwater levels in the overburden ranged from 3 to 28 feet btoc while groundwater levels in bedrock wells ranged from 4 to 31 feet btoc (Table 5.1-3). Based on the most recent groundwater gauging data from March 2019, overburden groundwater flows easterly towards Spring Creek, as shown on Figure 5.1-3. Calculated horizontal hydraulic gradients range between 0.04 and 0.11 ft/ft. Bedrock groundwater flow has been generally towards the east and southeast (Figure 2-3), also towards Spring Creek, with horizontal gradients ranging from 0.003 to 0.02 ft/ft. Based on 2019 groundwater elevations, an upward vertical gradient was observed at the well pair WBP-99-5 and WBP-MW1 (Table 5.1-3).

Hydraulic conductivity values calculated from slug tests in the overburden aquifer range from 0.034 to 2.4 feet per day (feet/day). In the bedrock aquifer, hydraulic conductivities are lower, ranging from 0.00015 to 0.019 feet/day (Tetra Tech, 2012).

5.2.3.3 Groundwater/Surface Water Interaction

Groundwater gauging data as described in the 2012 SRI, suggest that groundwater is discharging to Spring Creek and intermittently into the unnamed tributary (Tetra Tech, 2012). At JAW-23, groundwater elevations suggest the reach of the unnamed tributary in this area is variably gaining and losing (Figure 5.1-3). At WBP-99-5, groundwater elevations suggest that this reach of the unnamed tributary is primarily gaining (Figure 5.1-3). At WBP-99-3, historical groundwater elevations suggested that Spring Creek is a gaining stream in this area. Former well, WBP-99-3 was located approximately 500 feet downstream of the bend in Spring Creek that is located just north of JAW-24.

Between staff gauge installation in 2018 and the 2019 RI gauging event, the three new staff gauges (Staff Gauges EDA-1 through EDA-3) were damaged and accurate measurements could not be recorded during the sitewide gauging event. It is recommended that these staff gauges be repaired to obtain accurate measurements in the future.

5.2.4 Nature and Extent of Contamination

This subsection describes the nature and extent of contamination at the WBPA. Soil contamination has been addressed under OU-1; however, soil is discussed briefly to inform the CSM for potential groundwater contaminants. Spring Creek runs through the eastern portion of the WBPA, and a perennial tributary of Spring Creek is present along the northern boundary of the site.

The source of contamination at the WBPA is attributed to releases to the surface as a result of historical site operations, including open burn operations and flashing of explosives and waste disposal at the WBP landfills. Incomplete combustion of explosives compounds and metals from ash released to soil may have leached into groundwater.

5.2.4.1 Groundwater

Groundwater samples have been collected at the WBPA since 1981. Twenty-nine active monitoring wells are present at the WBPA. Ten wells are screened in the overburden to depths ranging from 6.5 to 35 feet bgs, one well is screened across the overburden bedrock transition (interface) zone from 5 to 10 feet bgs, and 18 wells are screened in bedrock at depths ranging from 10 to 80 feet bgs (Figure 5.1-2). Total well depths are present in Table 5.1-3. Historical groundwater samples were analyzed for VOCs, SVOCs, PAHs, explosives, metals, PCBs, radionuclides, and pesticides. No pesticides or PCBs were detected in historical groundwater samples, and SVOCs have not been detected in groundwater sampled since 1992 at the WBPA. Based on historical site operations and COCs identified in soil, explosives, VOCs, and metals are considered chemicals of interest in groundwater at the WBPA.

Samples were collected from 29 monitoring wells at the WBPA during the most recent RI activities between 2018 and 2020 and analyzed for explosives, VOCs, and/or metals (Figures 5.1-4 and 5.1-5). Three monitoring wells at the NPBs (JAW-12, JAW-13, and JAW-14), one monitoring well at the FTP (JAW-63) and one monitoring well at the EBPs (EBP-MW13) were also sampled for explosives, VOCs, or metals to support data quality objectives. Table 5.2-2 summarizes the chemicals detected in groundwater between 2000 and 2020 sampling events at the WBPA. Summary tables of all the analytical results (including nondetects) from the 2018–2020 RI activities are provided in Appendix G. Summary tables of all historical analytical results from the WBPA are provided in Appendix H.

VOCs

Thirty-eight VOCs have been detected in groundwater at the WBPA since 2000 (Table 5.2-2). However, only 1,1,2-trichlorotrifluoroethane (Freon 113), 1,1-dichloroethane (DCA), 1,1-dichloroethene (DCE), and TCE have exceeded the site characterization PALs since 2000. During the 2018–2020 RI, these four VOCs (Freon 113, 1,1-DCA, 1,1-DCE, and TCE) were detected at eight locations at the WBPA above their site characterization PALs. Freon 113 exceeded its site characterization PAL (10,000 µg/L) most frequently during the 2019 RI at seven locations (Figure 5.1-5). The maximum Freon 113 concentration was detected at WBP-99-6 (180,000 J µg/L).

VOCs are present in three plumes at the WBPA, two in the northern portion of the WBPA and one plume in the eastern portion of the WBPA (Figure 5.1-5). Of note is a large VOC plume that extends into the southeastern corner of the WBPS; however, this plume is associated with the FTP site (IAAP-039) and therefore is discussed in Section 5.5. The three VOC plumes in the WBPA appear to be relatively small and isolated; they are delineated by previous DPT groundwater and monitoring well data and new monitoring well data.

Explosives

Between 2000 and 2020, sixteen explosives were detected at the WBPA (Table 5.2-2). During the most recent RI monitoring event (2018–2020), only RDX, 2,6-DNT, and 1,3-dinitrobenzene exceeded their site characterization PALs at the WBPA. RDX, which exceeded its PAL (2 µg/L) at 15 locations at the WBPA (Table 5.2-2), is the most prevalent explosive detected in groundwater at the WBPA, as shown on Figure 5.1.4. Between 2000 and 2020, RDX concentrations have remained relatively stable at many wells in the WBPA (for example at WBP-99-1 [2.6–5.8 J µg/L], WBP-99-2 [23–74 J µg/L], WBP-TTMW-07R [1,100–5,430 µg/L, excluding one anomalous low result of 352 µg/L in November 2007], and WBP-TTMW-11 [850–3,640 µg/L, excluding one anomalous nondetect result in June 2009]) (Table 5.2-2). Concentrations of RDX have declined at some wells in the north of the WBPA, near the former treatability study (WBP-TTMW-05B), from a maximum of 273 µg/L in April 2007 to nondetect in March 2019; however, concentrations have also increased near this area (WBP-99-4 and JAW-23) between 2007 and 2019. Trend graphs from the WBPA show variable RDX concentrations have been observed between 2000 and 2019 (Figure 5.2-1). Historically, the maximum concentration of RDX has been detected at JAW-23 in 1997 (6,960 µg/L), although concentrations have decreased in recent years at this location to 35 µg/L in 2019 (Figure 5.2-1). During the 2019–2020 RI, the highest concentrations of RDX were detected at WBP-TTMW-11 at 940 µg/L (Table 5.2-2).

RDX is present predominantly in overburden (where groundwater is present) and shallow bedrock within one plume across the WBPA. As previously discussed, the overburden pinches out near Spring Creek, and groundwater is absent from this zone. The shallow RDX plume is delineated laterally to the west by WBP-DP03, WBP-DP04, and WBP-08 (upgradient of the WBPA). The northern plume boundary is delineated by a number of overburden and shallow bedrock monitoring wells (Figure 5.1-4), as well as by WBP-DP01, WBP-DP02, and WBP-DP20 to the north of the Spring Creek unnamed tributary. To the south, WBP-DP10, G-30, and WBP-TTMW-13 provide lateral delineation of the RDX plume. Well pair WBP-MW2/JAW-24 provides northeast delineation; however, directly to the east, the WBPA is delineated by monitoring wells in the EBPs (EBP-MW13 and EBP-MW17).

Within deep bedrock, RDX exceeded its site characterization PAL at in one well, WBP-MW8 (3.2 µg/L), screened 32 to 42 feet bgs in the north-central portion of the RDX plume. However, RDX was not detected in other deep bedrock wells, including WBP-MW3 (screened 40 to 50 feet bgs) or WBP-MW9, south and north of WBP-MW8, respectively. RDX was also not detected in the deep bedrock monitoring well WBP-MW6 near the northern plume boundary. Both WBP-MW6 and WBP-MW9 are screened deeper than WBP-MW8. Therefore, the vertical extent of the RDX plume is adequately delineated for this RI.

Metals

Eighteen metals have been detected in groundwater at the WBPA since 2000; however, only arsenic, barium, cadmium, iron, lead, and manganese have been detected above their site characterization PALs and BTVs. During the most recent 2019–2020 sampling events, only arsenic, iron, and manganese were detected above their respective PALs and BTVs. Arsenic exceeded its PAL (10 µg/L) and BTV (33.3 µg/L) at one location, WBP-99-5, in 2019 (37 µg/L). Iron exceeded its PAL (14,000 µg/L) and BTV (9736 µg/L) at 11 locations, and manganese exceeded its PAL (430) and BTV (580) at 12 locations in 2009. However, these elevated concentrations of iron and manganese are not considered site-related and are attributed to the enhanced reducing conditions created by the treatability study (Tetra Tech, 2010). As described in Table 5.2-1, high-fructose corn syrup was injected in the subsurface to assess the potential for enhanced bioremediation of Freon 113 and RDX in groundwater in 2005/2006 and 2007/2008. Analysis of iron and manganese were included in the 2005 though 2009 performance monitoring events for monitoring wells located within the treatability study boundary to help evaluate whether reducing conditions were being established. The iron and manganese exceedances were observed during these performance monitoring events. Prior to injections, only manganese exceeded its PAL at two locations (JAW-23 and WBP-99-5) in 2004.

Concentrations of some metals may be naturally elevated in the environment, and may not indicate a CERCLA-regulated release. Several metals (such as cadmium, chromium, lead, mercury, selenium, silver, and zinc) were detected below their BTVs during the latest sampling events and are therefore considered to be naturally occurring in groundwater at the WBPA.

5.2.4.2 Sediment and Surface Water

Surface water and sediment samples have been collected along Spring Creek, upstream and downstream of the EDA, and from the unnamed tributary along the northern portion of the WBPA (Figure 5.1-2). Surface water and sediment samples have been historically analyzed for explosives, VOCs, SVOCs, PAHs, PCBs, pesticides, herbicides (surface water only), and metals. SVOCs, PAHs, PCBs, pesticides, and herbicides have not been detected in surface water or sediment at the EDA. Tables 5.2-3 and 5.2-4 summarize the chemicals detected in surface water and sediment, respectively, between 2000 and 2020.

During the 2018 to 2020 RI, five surface water samples were collected from Spring Creek and its tributaries at the EDA and analyzed for explosives. Upstream and downstream surface water samples (EDA-SW04 and EDA-SW02) were also analyzed for metals and VOCs. The following analytes were detected in the 2018 to 2020 RI surface water samples: aluminum, barium, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, vanadium, molybdenum, zinc, and Freon 113. Summary tables of all the analytical results (including nondetects) from the 2018–2020 RI activities are provided in Appendix G. Summary tables of all historical analytical results from the WBPA are provided in Appendix H.

VOCs

Ten VOCs have been detected in surface water. However, only one VOC (chlorobenzene) was detected above its site characterization PAL, and only then at one location, SCT2, in 2004 (Table 5.2-3). SCT2 is located downstream of WBP-TTMW-01, along the unnamed tributary to Spring Creek in the northern portion of the WBPA (Figure 5.1-2). Chlorobenzene was not detected in surface water during subsequent sampling events at the EDA. In 2019, only one VOC was detected in surface water. Freon 113 was detected at EDA-SW04, located upstream of the EDA (Figure 5.1-6), at 2.1 J µg/L, orders of magnitude below its PAL (2,050,000 µg/L).

No VOCs were detected in sediment at the EDA (Appendix H).

Explosives

Fifteen explosives have been detected in surface water at the EDA. However, explosives have only been detected above PALs at one surface water location, SCT2, in 2003 and 2004 (Table 5.2-3). RDX exceeded its site characterization PAL in 2003 and five explosive compounds (1,3,5-trinitrobenzene, TNT, 2,6-DNT, 2-amino-4,6-DNT, and 4-amino-2,6-DNT) exceeded their PALs in June of 2004. However, all explosives were below their respective PALs at this location during subsequent sampling events in November 2004 through 2012 (Table 5.2-3). RDX was also not detected in the downstream surface water sample, EDA-SW02, during the 2019 RI sampling event (Figure 5.1-6). There were no other explosives detected in surface water above their site characterization PALs between 2000 and 2020.

No explosives were detected in sediment at the EDA (Appendix H).

Metals

Twenty-two metals have been detected in six surface water samples collected both upstream and downstream of the EDA since 2000. However, only 10 metals (aluminum, arsenic, barium, chromium, iron, lead, manganese, mercury, selenium, and vanadium) have exceeded their respective PALs and BTVs (if available) at nine surface water locations since 2000. The highest concentrations were detected in surface water samples SC08-H, SC09-H, SC13-H, and SCT2. Surface water samples SC08-H, SC09-H, and SC13-H were collected in September 2000; the samples were collected upstream of the EDA (SC13-H), downstream of the EDA (SC09-H), and between the WBPA and the EBPs (SC08-H). Metals concentrations detected in these three samples were within the same order of magnitude upstream of, within, and downstream of the EDA. (Figure 5.2-2). Because the concentrations are similar in both upstream and downstream samples, it is concluded that former EDA operations are not the source of metals in surface water in Spring Creek. Of note, the Roundhouse Transformer Storage Area (IAAP-040/040G) is the only IRP site upstream of the EDA; the only COCs identified in that area were PCBs. At SCT2, located along the unnamed tributary to Spring Creek in the northern portion of the WBPA, eight metals exceeded their PALs and BTVs at SCT2 in one sampling event, in June 2004. However, metals concentrations during this June 2004 sampling event were one to three orders of magnitude higher than in the previous four sampling events at this same location (Table 5.2-3), suggesting that the June 2004 concentrations were an anomaly. Noteworthy is that barium was the only metal detected above its PAL (220 µg/L) and BTV (236 µg/L) in surface water collected downstream of the WBPA during the same sampling event, at SC2 (253 µg/L). However, this concentration was similar to the barium concentration in the upstream sample, at SC5 (240 µg/L), indicating that elevated barium concentrations were not associated with the WBPA.

During the 2019 surface water sampling event, only dissolved aluminum and total manganese exceeded their PAL and BTVs in surface water (Figure 5.2-2). Manganese concentrations ranged from 140 J µg/L (EDA-SW04, upstream) to 170 µg/L (EDA-SW02, downstream). Given manganese concentrations from upstream and downstream surface water samples were within the same order of magnitude and dissolved manganese concentrations did not exceed the BTV, this metal is not considered to be site-related. Dissolved aluminum exceeded its PAL (87 µg/L) and BTV (75 µg/L) at EDA-SW02, downstream of the EDA. Although aluminum exceeded its BTV it is considered unlikely to be site-related given that aluminum did not exceed its BTV in groundwater and was not identified as a soil COC for the WBPA.

Twenty metals were detected in three sediment samples collected both upstream and downstream of the EDA since 2000. However, only manganese exceeded its PAL (460 µg/L) and BTV (2,300 µg/L) at one location, SC13-H, upstream of the EDA (Figure 5.2-2). Therefore, this exceedance is not considered to be site-related. Several metals (such as aluminum, arsenic, beryllium, cadmium, chromium, copper, iron, lead, nickel, selenium, silver, vanadium, and zinc) were detected in sediment at the EDA below their BTVs and are therefore considered to be consistent with background and naturally occurring.

5.2.5 Fate and Transport

This section discusses the fate and transport of site-related chemicals of interest at the WBPA. This includes chemicals that were detected above both their site characterization PAL and BTV (if available) during the last sampling event for which those chemicals were analyzed. In groundwater, the potential site-related chemicals of interest include VOCs (Freon 113, 1,1-DCA, 1,1-DCE, and TCE), explosives (RDX, 2,6-DNT, and 1,3-dinitrobenzene) and metals (arsenic). In surface water, only one potential site-related chemical of interest was identified, dissolved aluminum. No site-related chemicals of interest were identified for sediment. Fate and transport characteristics for these chemicals were described in Section 3.2.

The WBPA was formerly used for demilitarization by open burning and flashing of explosives and for waste disposal within the WBPs Landfill. The EDA is fenced, and the WBPA is largely vegetated. Two buildings are present at the WBPA, Building BG-13 and office Building 500-183, and a road runs through the center of the WBPA connecting to the EBPs (Figure 5.1-1). An underground viewing bunker is present near Building 500-183. The WBPA falls within the Spring Creek watershed (Figure 2-1), and Spring Creek runs along the eastern boundary of the site (Figure 5.1-1). A perennial unnamed tributary is present in the northern portion of the site, and a breached constructed sedimentation dam is present near the convergence of this tributary with Spring Creek. Surface water drainage occurs through the unnamed tributary and a number of intermittent drainage ditches that ultimately discharge to Spring Creek. The groundwater at the WBPA is present in two aquifers, overburden and bedrock groundwater. Groundwater levels measured in the overburden aquifer range from 1.5 to approximately 23 feet bgs while bedrock groundwater levels range from artesian to 45 feet bgs.

The source of contamination at the WBPA is attributed to unintended releases to the surface as a result of historical site operations, including open burn operations and waste disposal operations. Contaminants in groundwater have been transported from the source release areas through advection and dispersion. Groundwater generally flows east towards Spring Creek (Figure 5.1-3). Hydraulic conductivities of the overburden aquifer range from 0.034 to 2.4 feet per day (feet/day). In the bedrock aquifer, conductivities range from 0.00015 to 0.019 feet/day (Tetra Tech, 2012). Vertical migration at the site is also limited by the generally tight clay lithology in the overburden and the lack of fractures within the bedrock with depth.

As discussed in Table 5.2-1, a groundwater treatability study was conducted from 2005 through 2009 in the northwest portion of the RDX plume, near WBP-TTMW-05B and in the southeast portion of the RDX plume, near WBP-99-3, where historically the highest RDX and Freon 113 concentrations had been observed. DPT injections of a high-fructose corn syrup solution were completed around WBP-TTMW-05B in the north and around WBP-99-3 and WBP-TTMW-07R in the south. Following the treatability study, concentrations of RDX in groundwater decreased in the northern portion of the plume; however, inconsistent RDX concentrations were observed in the southeastern portion of the plume. It was concluded that competing terminal electron accepting processes prevented the sustained degradation of RDX in this location. In the northwest treatment zone, RDX concentrations at JAW-23 WBP-TTMW-04, and WBP-TTMW-08 were reduced to nondetect during within one year of injections; however, while the injections were successful directly around the injection site, RDX conditions to the east and west of the site remained largely unimpacted. Additionally, RDX concentrations at JAW-23 rebounded to 23 J µg/L in 2019.

Natural attenuation mechanisms that are potentially active at the WBPA were evaluated. Natural attenuation includes various physical, chemical, or biological processes that under favorable conditions act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. A weight-of-evidence approach was used for this evaluation.

- The primary line of evidence that attenuation is occurring at a site is reduction over time in contaminant concentrations or mass, or both.
  - Explosives were detected above their site characterization PALs in 15 overburden and shallow bedrock monitoring wells during the latest sampling event at the WBPA. Concentration trends were evaluated for RDX, which is the most extensive contaminant in groundwater at the WBPA. RDX concentrations in three of these wells (G-30, WBP-TTMW-03, and WBP-99-6) show decreasing trends since the early 2000s (Table 5.2-2). Recently, the highest concentrations of RDX were detected at shallow bedrock monitoring well WBP-TTMW-11 in 2019 (Table 5.2-2). Most RDX concentrations have remained relatively stable at the WBPA (Figure 5.2-1); however,

decreasing trends at WBP-MW2 and JAW-24, both located near the leading edge of the RDX plume, and a number of decreasing trends along the northern edge of the plume, may be indicative of natural attenuation. However, RDX concentrations increased (WBP-99-4 and JAW-23) between 2007 and 2019, which may be indicative of plume migration or rebound following the treatability study injections.

- VOCs were detected above their site characterization PALs in eight overburden and shallow bedrock monitoring wells during the latest sampling event at the WBPA. Freon 113 is the most extensive VOC in groundwater at the WBPA. In general, Freon 113 concentrations have remained stable at the WBPA.
- Arsenic was also identified as a chemical of interest in groundwater. As previously discussed, total arsenic exceeded its PAL (10 µg/L) and BTV (33.3 µg/L) at only one location, WBP-99-5 in 2019 (37 µg/L). Arsenic concentrations have fluctuated above and below the BTV over time in this well (Table 5.2-2).

- Anaerobic daughter products of RDX were detected at Line 2 in 2018. Low levels (< 5 to 36 J µg/L) of MNX, TNX, and DNX were detected at monitoring wells JAW-23, JAW-25, WBP-99-2, WBP-99-6, WBP-TTMW-02, WBP-TTMW-03, WBP-TTMW-06, and WBP-TTMW-11 providing evidence that anaerobic biodegradation of RDX is occurring at the WBPA.
- On the contrary, other than 1,1-DCE, no reductive degradation products of TCE were observed during the 2019 sampling event. However, the presence of 1,1-DCE and 1,1-DCA may be due to degradation of 1,1,1-TCA, which was historically detected in groundwater at the WBPA (Table 5.2-2). During the 2005–2009 treatability study, groundwater samples were analyzed for ethane and ethene. Both of these dissolved gasses were detected at low levels, indicating that the injections likely enhanced biodegradation of the chlorinated VOCs during this time period.
- Water quality parameters can be used to evaluate whether the geochemical conditions are conducive to biodegradation. During the current RI, groundwater was observed to be under generally aerobic and oxidizing conditions, except at five monitoring wells along the northern RDX plume edge (WBP-99-5, WBP-99-6, WBP-MW2, WBP-MW9, and WBP-TTMW-04) and one deep bedrock well in the center of the plume (WBP-MW3). DO concentrations in groundwater at the WBPA ranged from 0.26 to 8.13 mg/L, and ORP values ranged from -110 to +183 mV (Tables 5.1-5). pH values were relatively neutral (between 6 and 7), which is favorable for biological activity.
- Under these geochemical conditions, anaerobic biodegradation of explosives, particularly RDX, and VOCs may be favorable along the northern edge of the plume where more anaerobic conditions have been observed. However, Freon 113 has shown to be persistent in groundwater (U.S. National Library of Medicine, 2015).
- In areas of the site where conditions are more aerobic and oxidizing, RDX and 1,1-DCE degradation is less favorable. However, 1,1-DCA and TCE can degrade via aerobic cometabolism, which may explain the lack of reductive daughter products. Freon 113, 2,6-DNT, and 1,3-dinitrobenzene can also degrade under aerobic conditions, but Freon 113 may be persistent, and 1,3-dinitrobenzene degradation may be slow. In addition, TCE and RDX can degrade by abiotic means.

The physical natural attenuation processes are also likely helping to stabilize the plumes, given the stable extent of the plumes. While the explosives in groundwater have moderate solubility and relatively low sorption potential, it should be retarded somewhat as it sorbs to the clay geology. Freon 113 also has moderate water solubility and a moderately low sorption potential, while other VOCs are characterized by relatively high solubilities and low sorption potential (Table 4.2-1). The minimal thickness of the overburden aquifer in the WBPA may also be a factor that is limiting plume migration. Explosives have limited volatility (Table 4.2-1) and therefore are unlikely to volatilize into soil gas at the water table interface, while the VOCs have a high vapor pressure and may volatilize into soil gas at the interface with the water table.

Arsenic was the only metal to exceed its PAL and BTV in groundwater during the most recent sampling event in 2019. In oxidizing environments, arsenic can be present in a form that is more mobile; however, it will potentially sorb or complex with clays, organic material, iron hydroxides, or manganese oxides, limiting its mobility (ERG, 2005).

Dissolved aluminum was the only metal to exceed its PAL and BTV in surface water downstream of the EDA, during the most recent sampling event, in 2019. In oxidizing environments, aluminum will tend to be in its immobile form, aluminum hydroxide. Aluminum may also potentially sorb or complex with clays, organic material, iron hydroxides, or manganese oxides, limiting its mobility (ERG, 2005).

5.2.6 Human Health Risk Assessment

An HHRA was prepared for the WBPA to evaluate potential current and future health risks and hazards from exposure to chemicals in site groundwater, surface water, and sediment. Soil media is not included in the HHRA as it is not a component of this RI; soil is addressed under the remedies for OU-1 (IAAP-032) (Leidos, 2018). A brief summary of OU-1 soil COCs is provided in Section 5.2.1.3 and historical remedial activities for soil are presented in Table 5.2-1. MEC and MC in soil and groundwater have also been addressed under OU-5 (IAAP-003-R-01 and IAAP-005-R-01); NFA is documented for these sites in the OU-5 ROD (CB&I, 2014).

The HHRA was conducted in accordance with the final UFP-QAPP (CH2M, 2017a), with the exception of some deviations that were agreed to during meetings or correspondence with USACE and USEPA following approval of the final UFP-QAPP. The approach and method used to conduct the HHRA are provided in Section 4.3.1. This section presents the CEM for the WBPA and provides the results of the four-step evaluation process comprising the following:

- Data evaluation.
- Exposure assessment.
- Toxicity assessment.
- Risk characterization.

The results of the HHRA are used to determine if further action is warranted for groundwater, surface water, and sediment at the WBPA.

5.2.6.1 Conceptual Exposure Model

A description of the WBPA, its operational history, previous investigations, and remedial actions are provided in Sections 5.2.1 and 5.2.2. The soil at the WBPA is addressed under the remedy for OU-1 (IAAP-032 and IAAP-005-R-01) (Leidos, 2018; USACE and Dawson, 2021) and was not reevaluated in this HHRA.

The WBPA is largely inactive and was used for demilitarization by open burning at the burn pads, which were constructed of earthen material, and burn cages, which were constructed of steel. The WBPs consisted of cleared ground with soil berm barriers. Two buildings are present at the WBPA: a wash-down building (BG-13) and an office building (Building 500-183) (Figure 5.1-1). Building BG-13 remains active and, as of July 2012, is used to wash down explosives-contaminated equipment (Tetra Tech, 2012). When the WBPA was active, Building 500-183 was used as a break room for IAAAP employees, but it is now vacant and scheduled for demolition. An underground viewing bunker is still present near Building 500-183.

Spring Creek and perennial tributaries are present within the WBPA site boundary. The site is partially open to recreational activities; therefore, hunting is permitted within the site boundary. Culverts are present at the site; therefore, potential groundwater exposures by future construction/utility workers are complete at the WBPA.

Groundwater is not currently being used as a potable water source and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the WBPA is classified as Class IIB, a potential source of drinking water (USEPA, 1989). Therefore, the HHRA for the WBPA evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future residential exposures to groundwater.

The following potential current and future human receptors were identified in the HHRA for the WBPA:

- **Current and Future Hunters/Recreators (Adult and Adolescent).** Current hunters/recreators could be exposed to surface water and sediment in perennial water bodies while hunting and recreating at the WBPA.
- **Current Site Workers.** Current site workers could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in Building BG-13.
- **Future Site Workers.** Future site workers could contact groundwater based on potential future use as a drinking water source at the WBPA and could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in buildings.
- **Future Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert located within the WBPA site.
- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on potential future use as a drinking water source at the WBPA and could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in future buildings.

As discussed in Section 4.3.1, potential exposures and risks and hazards to current and future site workers and future construction/utility workers are estimated in the HHRA only if the estimated risks and hazards for a hypothetical residential scenario exceed acceptable risk levels and COCs are identified for a residential scenario. The human health CEM presenting potential exposure media, exposure points, receptors, and exposure routes is provided in Appendix A-3, Attachment 1 (Table 1), and depicted graphically in Figure 5.2-3.

5.2.6.2 Data Evaluation

Data Used in the HHRA

The analytical data used in the HHRA consist of surface water and sediment samples collected from Spring Creek and its tributaries and groundwater samples collected at the WBPA.

- **Surface Water.** Three historical surface water samples collected in 2012 and three recent surface water samples collected in 2019 were included in the HHRA. The 2012 surface water samples were analyzed for explosives and VOCs; the surface water samples collected in 2019 were analyzed for explosives (all nondetect), metals, PAHs (all nondetect), and VOCs.
- **Sediment.** Spring Creek is a perennial water body. Three historical sediment samples collected in 2000 from the creek were used in the HHRA for the WBPA. The sediment samples were analyzed for metals. As stated in the UFP-QAPP (CH2M, 2017), "Older data (i.e., data collected prior to 2012) may be used in the human health risk assessments if they are still representative of the site (i.e., groundwater flow is slow), chemicals have properties where there would not be a significant reduction in concentrations over time (e.g., metals), or data are conservative for site conditions."

The WBPA is no longer operational, as described in Section 5.2.1. Potential soil sources to groundwater have been remediated, as described in Section 5.2.1.3. Due to a lack of continuing sources, historical concentrations in groundwater are expected to have remained stable or even decreased due to natural attenuation processes. Therefore, the assumptions in the final UFP-QAPP still hold. Samples collected prior to 2012 are considered representative of, or more conservative than, current conditions at the WBPA.

- **Groundwater.** Recent groundwater samples collected in 2019 and 2020 were used in the HHRA for the WBPA. The groundwater samples collected in 2019 were analyzed for explosives, metals, PAHs, and VOCs. The groundwater sample collected in 2020 was analyzed for explosives, PAHs, and VOCs. Thirty-one groundwater samples were used to evaluate potential exposures for both a potable use scenario and the VI pathway. The groundwater samples were not collected at multilevel wells; therefore, a separate data grouping (based on shallow groundwater only) was not used to evaluate the VI pathway. A separate groundwater data grouping was used to evaluate a construction/utility worker scenario, assuming construction/utility workers could be exposed to groundwater encountered at depths up to 10 feet bgs. Fifteen groundwater samples were used to evaluate potential exposures in a trench for a construction/utility worker.

A summary of the number of chemicals analyzed and detected in site media is provided below:

Chemical Group	Number of Chemicals Analyzed	Number of Chemicals Detected
Groundwater		
Explosives	17	11
Metals	8	5
PAHs	1	1
SVOCs	5	0
VOCs	61	27
Sediment		
Explosives	14	0
Metals	23	20
Surface Water		
Explosives	17	2
Metals	24	12
PAHs	1	0
SVOCs	5	0
VOCs	62	2

A description of the data groupings and samples included in the HHRA are provided in Tables 5.2-5 and 5.2-6, respectively. The analytical dataset used in the HHRA is included in Excel format as Appendix A-3, Attachment 2. The groundwater sampling locations included in the HHRA are depicted in Figure 5.1-11.

Screening Results for Site-related Chemicals of Potential Concern and Naturally Occurring Chemicals

The approach and SLs used to select the COPCs (site-related COPCs or naturally occurring chemicals) are described in Section 4.3.1. The results of the COPC screening process for groundwater are provided in

Appendix A-3, Attachment 1 (Tables 2.1 through 2.5). The COPCs (site-related COPCs) identified in site groundwater are summarized in the tables below.

Summary of COPCs for the WBPA—Site-Related

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Surface Water—No COPCs				
Sediment—No COPCs				
Groundwater Used for Tap Water				
Future Site Worker and Future Hypothetical Resident	1,3-Dinitrobenzene	1 / 29	2.8	2.8
	2,6-Dinitrotoluene	2 / 29	0.34	1
	2-Amino-4,6-dinitrotoluene	6 / 29	0.068	0.54
	4-Amino-2,6-dinitrotoluene	9 / 29	0.058	1.1
	HMX	20 / 29	0.55	450
	RDX	17 / 29	0.51	940
	Arsenic	1 / 8	37	37
	Barium	8 / 8	15	960
	Naphthalene	4 / 25	0.27	3.2
	1,1,2-Trichlorotrifluoroethane (Freon 113)	19 / 25	0.84	180000
	1,1-Dichloroethane	5 / 25	0.36	3.5
	1,1-Dichloroethene	8 / 25	0.24	79
	Benzene	4 / 25	0.17	0.47
	Bromomethane	3 / 25	1.3	8.4
	Chloroform	6 / 25	0.16	21
	cis-1,2-Dichloroethene	7 / 25	0.35	57
	Dichlorodifluoromethane	9 / 25	0.33	230
	Ethylbenzene	3 / 25	0.43	1.9
	Trichloroethene	9 / 25	0.17	54
Groundwater to Indoor Air via Vapor Intrusion				
Current and Future Site Worker and Future Hypothetical Resident	1,1,2-Trichlorotrifluoroethane (Freon 113)	19 / 25	0.84	180000
	1,1-Dichloroethene	8 / 25	0.24	79
	Bromomethane	3 / 25	1.3	8.4
	Chloroform	6 / 25	0.16	21
	cis-1,2-Dichloroethene	7 / 25	0.35	57
	Dichlorodifluoromethane	9 / 25	0.33	230

Summary of COPCs for the WBPA—Site-Related

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
	Trichloroethene	9 / 25	0.17	54
Shallow Groundwater in a Trench (<10 ft bgs)				
Future Construction / Utility Worker	1,3-Dinitrobenzene	1 / 15	2.8	2.8
	2,6-Dinitrotoluene	1 / 15	1	1
	2-Amino-4,6-dinitrotoluene	2 / 15	0.42	0.51
	4-Amino-2,6-dinitrotoluene	5 / 15	0.11	1.1
	HMX	11 / 15	0.55	450
	RDX	8 / 15	0.51	940
	Barium	5 / 5	15	640
	Naphthalene	1 / 14	0.27	0.27
	1,1,2-Trichlorotrifluoroethane (Freon 113)	11 / 14	0.84	28000
	1,1-Dichloroethane	3 / 14	0.36	3.5
	1,1-Dichloroethene	6 / 14	0.24	29
	Bromomethane	1 / 14	8.4	8.4
	Chloroform	3 / 14	0.16	2.2
	cis-1,2-Dichloroethene	5 / 14	0.35	57
	Dichlorodifluoromethane	8 / 14	0.33	230
	Trichloroethene	6 / 14	0.17	54

Summary of COPCs for the WBPA—Naturally Occurring Chemicals

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Groundwater Used for Tap Water				
Future Site Worker and Future Hypothetical Resident	Cadmium	1/8	0.63	0.63
Shallow Groundwater in a Trench (<10 ft bgs)				
Future Construction / Utility Worker	Cadmium	1/5	0.63	0.63

5.2.6.3 Exposure Assessment

The WBPA is largely inactive; two buildings are present at the site. One building, BG-13, was still active as of 2012 and is used to wash down explosives-contaminated equipment. The second building, Building 500-183, is vacant and scheduled for demolition. A portion of the site is open to recreational activities and hunting is permitted within the site boundary. Spring Creek flows adjacent to several environmental sites within the EDA (Figure 5.1-1). Because the largest portion of Spring Creek and perennial tributaries are present within the WBPA site boundary, risk assessment of surface water and sediment is included with the WBPA site. As previously discussed, groundwater is not currently being used as a potable water source; however, the HHRA for the WBPA evaluated potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future residential exposures to groundwater. Therefore, ingestion and dermal contact exposures to COPCs in groundwater were estimated for future site workers and hypothetical residents. Additionally, inhalation exposures to site groundwater were also evaluated for hypothetical residents, assuming VOCs could be present in household air as a result of showering, bathing, and other household activities. The vapor intrusion pathway is also considered potentially complete for groundwater for the current active building and for future industrial buildings or residences that are constructed at the WBPA; therefore, potential inhalation exposures to indoor air were evaluated for current and future site workers and future hypothetical residents. Culverts are located at the WBPA; therefore, potential ingestion, dermal contact, and inhalation exposures to shallow groundwater in a trench were evaluated for future construction/utility workers. The potential exposure pathways quantified in the HHRA are included in Appendix A-3, Attachment 1 (Table 1), and on Figure 5.2-3. The following receptor scenarios were quantified in the HHRA for the WBP:

- Current Site Worker
  - Groundwater (vapor intrusion) COPCs—inhalation of volatiles in indoor air
- Future Site Worker
  - Groundwater (tap water) COPCs—ingestion and dermal contact
  - Groundwater (vapor intrusion) COPCs—inhalation of volatiles in indoor air
- Future Construction/Utility Worker
  - Shallow groundwater (trench, 0 to 10 feet bgs) COPCs—incidental ingestion, dermal contact and inhalation of volatiles
- Future hypothetical residents (adult and child)
  - Groundwater (tap water) COPCs—ingestion, dermal contact, and inhalation of volatiles in
  - household air
  - Groundwater (vapor intrusion) COPCs—inhalation of volatiles in indoor air

Risks and hazards for site workers and construction/utility workers were quantified in the HHRA because the estimated risks or hazards for a hypothetical residential scenario exceeded acceptable risk or hazard levels and COCs were identified for a residential scenario. Risk and hazards for hunter/recreators were not quantified in the HHRA because no surface water or sediment COPCs were identified.

In accordance with USEPA guidance *Determining Groundwater Exposure Point Concentrations, Supplemental Guidance* (USEPA, 2014b), groundwater EPCs are typically calculated based on the data collected in the core of a plume. One RDX plume (Figure 5.1-4) and three VOC plumes (Figure 5.1-5) are present at the WBPA; no recent samples were collected from one of the VOC plumes.

Monitoring Wells and Number of Samples from Core of WBPA Plumes

	Plume			
	RDX	**West VOC**	**East VOC**	**South VOC**
Sample Count	23	7	5	0
Monitoring Wells	JAW-23 JAW-25 JAW-68 WBP-99-1 WBP-99-2 WBP-99-4 WBP-99-5 WBP-99-6 WBP-MW1 WBP-MW3 WBP-MW6 WBP-MW8 WBP-MW9 WBP-TTMW-01 WBP-TTMW-02 WBP-TTMW-03 WBP-TTMW-05B WBP-TTMW-06 WBP-TTMW-11 WBP-TTMW-12 WBP-TTMW-14 WBP-TTMW-15	JAW-23 WBP-99-6 WBP-MW6 WBP-MW9 WBP-TTMW-05B WBP-TTMW-06 WBP-TTMW-11	WBP-99-5 WBP-MW1 WBP-TTMW-01 WBP-TTMW-02 WBP-TTMW-03	—

The groundwater EPCs calculated for each plume are provided in Appendix A-3, Attachment 1, Table 3.1 (potable use) and Table 3.3 (groundwater in trench/culvert). For the VI pathway, the sitewide data set was used to estimate the EPCs, as provided in Appendix A-3, Attachment 1, Table 3.2. Future receptors were assumed to have potential exposure to groundwater from all plumes/COPCs; therefore, the highest EPC of the three plumes (or sitewide maximum detected concentration for COPCs not associated with a plume) was selected as the final EPC for each COPC. As discussed in Section 4.3.1.3, the UCL concentration was calculated for each COPC where at least eight samples were available and at least four detected concentrations were observed and the UCLs were selected as the EPCs. The maximum detected concentration was selected as the EPC for COPCs when fewer than four detected concentrations or eight samples were available in the groundwater dataset, since a reliable UCL could not be estimated due to the limited number of detected concentrations or samples. The ProUCL output for the COPCs is provided in Appendix A-3, Attachment 3.

The exposure factors used in the intake calculations for receptor scenarios are included in Appendix A-3, Attachment 1 (Tables 4.1 through 4.5). The primary references for the exposure factor values are the standard default exposure factors presented in the HHEM (USEPA, 2014a).

One COPC (TCE) was identified as acting with an MMOA in site media. The ADAFs and exposure assumptions used to calculate adjusted intakes and exposure concentrations for TCE are provided in Appendix A-3, Attachment 1 (Table 4 Supplement).

5.2.6.4 Toxicity Assessment

The oral toxicity values (CSFs and RfDs) and inhalation toxicity values (IURs and RfCs) used in the HHRA were obtained from the USEPA standard hierarchy of toxicity value sources (USEPA, 2003), as provided in Section 4.3.1. Noncancer toxicity values for the COPCs identified at the WBPA are provided in Appendix A-3, Attachment 1 (Tables 5.1 and 5.2). Cancer toxicity values for the COPCs are provided in Appendix A-3, Attachment 1 (Tables 6.1 and 6.2).

5.2.6.5 Risk Characterization

The risk characterization for the WBPA was completed using a four-step process, as discussed in Section 4.3.1. The results of each step are discussed below.

Step 1: Total Combined Risks and Hazards from Site-related COPCs and Naturally Occurring Chemicals

Step 1 consists of calculating receptor-specific ELCRs and His that include contributions from both site-related COPCs and naturally occurring chemicals. No naturally occurring chemicals were identified as COPCs. The estimated risks and hazards for a hypothetical residential scenario are summarized in Step 3 below in Table 5.2-7.

Table 5.2-7. Summary of Total Combined Risk and Hazard Estimates for Site-related COPCs and Naturally Occurring Chemicals— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-2, Attachment 1	Exposure Medium	COPC/Chemical	West Burn Pad Area		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.1 and 9.1	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2470000	NA	474
			1,1-Dichloroethene	55.5	NA	0.3
			Bromomethane	1.76	NA	0.3
			Chloroform	1.93	NA	0.02
			cis-1,2-Dichloroethene	5.72	NA	0.1
			Dichlorodifluoromethane	2490	NA	24
			Trichloroethene	12.6	NA	6
			Total HI (Groundwater—Indoor Air):		**NA**	**504**[g]
		Groundwater (Tap water)	1,3-Dinitrobenzene	2.8	NA	0.9
			2,6-Dinitrotoluene	1	NA	0.1
			2-Amino-4,6-dinitrotoluene	0.54	NA	0.2
			4-Amino-2,6-dinitrotoluene	1.1	NA	0.3

Table 5.2-7. Summary of Total Combined Risk and Hazard Estimates for Site-related COPCs and Naturally Occurring Chemicals— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road

Iowa Army Ammunition Plant, Middletown, Iowa

			HMX	450	NA	0.3
			RDX	940	NA	7
			Arsenic	37	NA	4
			Barium	960	NA	0.2
			Cadmium	0.63	NA	0.2
			Naphthalene	3.2	NA	0.5
			1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	NA	18
			1,1-Dichloroethane	3.5	NA	0.0006
			1,1-Dichloroethene	79	NA	0.2
			Benzene	0.47	NA	0.01
			Bromomethane	8.4	NA	1
			Chloroform	21	NA	0.2
			cis-1,2-Dichloroethene	57	NA	1
			Dichlorodifluoromethane	230	NA	1
			Ethylbenzene	1.9	NA	0.002
			Trichloroethene	54	NA	17
			Total HI (Groundwater—Tap Water):		**NA**	**51[g]**
	Total HI (Groundwater—Indoor Air and Tap Water):				**NA**	**556[g]**
Hypothetical Resident (Child)	7.2 and 9.2	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2470000	NA	474
			1,1-Dichloroethene	55.5	NA	0.3
			Bromomethane	1.76	NA	0.3
			Chloroform	1.93	NA	0.02
			cis-1,2-Dichloroethene	5.72	NA	0.1
			Dichlorodifluoromethane	2490	NA	24
			Trichloroethene	12.6	NA	6
			Total HI (Groundwater—Indoor Air):		**NA**	**504[g]**

Table 5.2-7. Summary of Total Combined Risk and Hazard Estimates for Site-related COPCs and Naturally Occurring Chemicals— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road

Iowa Army Ammunition Plant, Middletown, Iowa

		Groundwater (Tap water)	1,3-Dinitrobenzene	2.8	NA	1
			2,6-Dinitrotoluene	1	NA	0.2
			2-Amino-4,6-dinitrotoluene	0.54	NA	0.3
			4-Amino-2,6-dinitrotoluene	1.1	NA	0.6
			HMX	450	NA	0.4
			RDX	940	NA	12
			Arsenic	37	NA	6
			Barium	960	NA	0.3
			Cadmium	0.63	NA	0.3
			Naphthalene	3.2	NA	0.5
			1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	NA	18
			1,1-Dichloroethane	3.5	NA	0.0009
			1,1-Dichloroethene	79	NA	0.3
			Benzene	0.47	NA	0.01
			Bromomethane	8.4	NA	1
			Chloroform	21	NA	0.2
			cis-1,2-Dichloroethene	57	NA	2
			Dichlorodifluoromethane	230	NA	1
			Ethylbenzene	1.9	NA	0.002
			Trichloroethene	54	NA	19
			Total HI (Groundwater—Tap Water):		**NA**	**63[g]**
	Total HI (Groundwater—Indoor Air and Tap Water):				**NA**	**568[g]**
Hypothetical Resident (Adult/Child Aggregate)	7.3 and 9.3	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2470000	NA	NA
			1,1-Dichloroethene	55.5	NA	NA
			Bromomethane	1.76	NA	NA
			Chloroform	1.93	2E-05	NA

Table 5.2-7. Summary of Total Combined Risk and Hazard Estimates for Site-related COPCs and Naturally Occurring Chemicals— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road

Iowa Army Ammunition Plant, Middletown, Iowa

			cis-1,2-Dichloroethene	5.72	NA	NA
			Dichlorodifluoromethane	2490	NA	NA
			Trichloroethene	12.6	3E-05	NA
			Total ELCR (Groundwater—Indoor Air):		**4E-05**	**NA**
		Groundwater (Tap water)	1,3-Dinitrobenzene	2.8	NA	NA
			2,6-Dinitrotoluene	1	2E-05	NA
			2-Amino-4,6-dinitrotoluene	0.54	NA	NA
			4-Amino-2,6-dinitrotoluene	1.1	NA	NA
			HMX	450	NA	NA
			RDX	940	1E-03	NA
			Arsenic	37	7E-04	NA
			Barium	960	NA	NA
			Cadmium	0.63	NA	NA
			Naphthalene	3.2	3E-05	NA
			1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	NA	NA
			1,1-Dichloroethane	3.5	1E-06	NA
			1,1-Dichloroethene	79	NA	NA
			Benzene	0.47	1E-06	NA
			Bromomethane	8.4	NA	NA
			Chloroform	21	1E-04	NA
			cis-1,2-Dichloroethene	57	NA	NA
			Dichlorodifluoromethane	230	NA	NA
			Ethylbenzene	1.9	1E-06	NA
			Trichloroethene	54	1E-04	NA
			Total ELCR (Groundwater—Tap Water):		**2E-03[h]**	**NA**
	Total ELCR (Groundwater—Indoor Air and Tap Water):				**2E-03[h]**	**NA**

Notes:

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic His were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water) and shallow groundwater (trench) - µg/L; groundwater (indoor air—vapor intrusion) and shallow groundwater (trench air) - µg/m^3

Step 2: Risk Characterization of Naturally Occurring Chemicals

Step 2 consists of calculation of receptor-specific ELCRs and His for naturally occurring chemicals. One COPC (cadmium) was identified as naturally occurring/or not site-related chemical in site groundwater at the WPBA, as discussed in Section 5.2.4.2. The maximum detected concentration of cadmium was less than its BTV. The estimated risks and hazards for cadmium in groundwater for a future hypothetical residential scenario are provided below in Table 5.2-8. Naturally occurring chemicals are not used to identify the final COCs for the WBPA and are not discussed further in the HHRA after this step.

Table 5.2-8. Summary of Risk and Hazard Estimates for Naturally Occurring Chemicals— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-2, Attachment 1	Exposure Medium	Chemical	East Burn Pads		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.4 and 9.4	Groundwater (Tap water)	Cadmium	0.63	NA	0.2
			Total HI (Groundwater—Tap Water):		**NA**	**0.2**
Hypothetical Resident (Child)	7.5 and 9.5	Groundwater (Tap water)	Cadmium	0.63	NA	0.3
			Total HI (Groundwater—Tap Water):		**NA**	**0.3**
Hypothetical Resident (Adult/Child Aggregate)	7.6 and 9.6	Groundwater (Tap water)	Cadmium	0.63	NA	NA
			Total HI (Groundwater—Tap Water):		**NA**	**NA**

Notes:

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic His were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water)—µg/L

Step 3: Risk Characterization of Site-related COPCs

Step 3 consists of calculating receptor-specific ELCRs and His associated with site-related COPCs. Nineteen COPCs (six explosives, two metals, one SVOC, and 10 VOCs) were identified as site-related COPCs for groundwater at the WBPA. The estimated risks and hazards for site-related COPCs in groundwater for a current site worker, future site worker, future construction/utility worker, and future hypothetical resident are provided in Table 5.2-9.

Table 5.2-9 Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-3, Attachment 1	Exposure Medium	COPC	WBPA		
				EPC [b]	ELCR	HI
Site Worker (Current)	7.7 and 9.7	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2470000	NA	113
			1,1-Dichloroethene	55.5	NA	0.06
			Bromomethane	1.76	NA	0.08
			Chloroform	1.93	4E-06	0.005
			cis-1,2-Dichloroethene	5.72	NA	0.03
			Dichlorodifluoromethane	2490	NA	6
			Trichloroethene	12.6	4E-06	1
			Total ELCR and HI (Groundwater—Indoor Air):		**8E-06**	**120**[c]
Site Worker (Future)	7.8 and 9.8	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2470000	NA	113
			1,1-Dichloroethene	55.5	NA	0.06
			Bromomethane	1.76	NA	0.08
			Chloroform	1.93	4E-06	0.005
			cis-1,2-Dichloroethene	5.72	NA	0.03
			Dichlorodifluoromethane	2490	NA	6
			Trichloroethene	12.6	4E-06	1
			Total ELCR and HI (Groundwater—Indoor Air):		**8E-06**	**120**[d]
		Groundwater (Tap water)	1,3-Dinitrobenzene	2.8	NA	0.2
			2,6-Dinitrotoluene	1	5E-06	0.03
			2-Amino-4,6-dinitrotoluene	0.54	NA	0.05
			4-Amino-2,6-dinitrotoluene	1.1	NA	0.09
			HMX	450	NA	0.08
			RDX	940	2E-04	2
			Arsenic	37	2E-04	1

Table 5.2-9 Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-3, Attachment 1	Exposure Medium	COPC	WBPA		
				EPC [b]	ELCR	HI
			Barium	960	NA	0.04
			Naphthalene	3.2	1E-06	0.002
			1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	NA	0.05
			1,1-Dichloroethane	3.5	6E-08	0.0002
			1,1-Dichloroethene	79	NA	0.01
			Benzene	0.47	8E-08	0.001
			Bromomethane	8.4	NA	0.05
			Chloroform	21	2E-06	0.02
			cis-1,2-Dichloroethene	57	NA	0.2
			Dichlorodifluoromethane	230	NA	0.01
			Ethylbenzene	1.9	7E-08	0.0002
			Trichloroethene	54	8E-06	0.9
			Total ELCR and HI (Groundwater—Tap Water):		**4E-04[e]**	**5[d]**
	Total ELCR and HI (Groundwater—Indoor Air and Tap Water):				**4E-04[e]**	**125[d]**
Construction/ Utility Worker	7.9 and 9.9	Shallow Groundwater (Trench)	1,3-Dinitrobenzene	2.8	NA	0.002
			2,6-Dinitrotoluene	1	6E-10	0.0002
			2-Amino-4,6-dinitrotoluene	0.51	NA	0.0009
			4-Amino-2,6-dinitrotoluene	1.1	NA	0.002
			HMX	450	NA	0.001
			RDX	940	6E-09	0.002
			Barium	640	NA	0.003
			Naphthalene	0.27	1E-10	0.000003
			1,1,2-Trichlorotrifluoroethane (Freon 113)	28000	NA	0.003
			1,1-Dichloroethane	3.5	8E-12	0.000002

Table 5.2-9 Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-3, Attachment 1	Exposure Medium	COPC	WBPA		
				EPC [b]	ELCR	HI
			1,1-Dichloroethene	29	NA	0.005
			Bromomethane	8.4	NA	0.0007
			Chloroform	2.2	3E-11	0.00002
			cis-1,2-Dichloroethene	57	NA	0.004
			Dichlorodifluoromethane	230	NA	0.006
			Trichloroethene	54	2E-09	0.2
			Total ELCR and HI (Shallow Groundwater—Trench):		**9E-09**	**0.2**
		Trench Air	Naphthalene	2	8E-10	0.02
			1,1,2-Trichlorotrifluoroethane (Freon 113)	168522	NA	0.10
			1,1-Dichloroethane	29	6E-10	NA
			1,1-Dichloroethene	242	NA	0.03
			Bromomethane	70	NA	0.02
			Chloroform	16	5E-09	0.002
			cis-1,2-Dichloroethene	470	NA	NA
			Dichlorodifluoromethane	787	NA	0.02
			Trichloroethene	386	2E-08	6
			Total ELCR and HI (Shallow Groundwater—Trench Air):		**3E-08**	**6[f]**
	Total ELCR and HI (Shallow Groundwater—Groundwater and Trench Air):				**4E-08**	**6[f]**
Hypothetical Resident (Adult)	7.10 and 9.10	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2470000	NA	474
			1,1-Dichloroethene	55.5	NA	0.3
			Bromomethane	1.76	NA	0.3
			Chloroform	1.93	NA	0.02
			cis-1,2-Dichloroethene	5.72	NA	0.1

Table 5.2-9 Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-3, Attachment 1	Exposure Medium	COPC	WBPA		
				EPC [b]	ELCR	HI
			Dichlorodifluoromethane	2490	NA	24
			Trichloroethene	12.6	NA	6
			Total HI (Groundwater—Indoor Air):		**NA**	**504[g]**
		Groundwater (Tap water)	1,3-Dinitrobenzene	2.8	NA	0.9
			2,6-Dinitrotoluene	1	NA	0.1
			2-Amino-4,6-dinitrotoluene	0.54	NA	0.2
			4-Amino-2,6-dinitrotoluene	1.1	NA	0.3
			HMX	450	NA	0.3
			RDX	940	NA	7
			Arsenic	37	NA	4
			Barium	960	NA	0.2
			Naphthalene	3.2	NA	0.5
			1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	NA	18
			1,1-Dichloroethane	3.5	NA	0.0006
			1,1-Dichloroethene	79	NA	0.2
			Benzene	0.47	NA	0.01
			Bromomethane	8.4	NA	1
			Chloroform	21	NA	0.2
			cis-1,2-Dichloroethene	57	NA	1
			Dichlorodifluoromethane	230	NA	1
			Ethylbenzene	1.9	NA	0.002
			Trichloroethene	54	NA	17
			Total HI (Groundwater—Tap Water):		**NA**	**51[g]**
	Total HI (Groundwater—Indoor Air and Tap Water):				**NA**	**556[g]**

Table 5.2-9 Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road
Iowa Army Ammunition Plant, Middletown, Iowa

				WBPA		
Receptor [a]	**ELCR/HI Tables (RME) in Appendix A-3, Attachment 1**	**Exposure Medium**	**COPC**	**EPC [b]**	**ELCR**	**HI**
Hypothetical Resident (Child)	7.11 and 9.11	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2470000	NA	474
			1,1-Dichloroethene	55.5	NA	0.3
			Bromomethane	1.76	NA	0.3
			Chloroform	1.93	NA	0.02
			cis-1,2-Dichloroethene	5.72	NA	0.1
			Dichlorodifluoromethane	2490	NA	24
			Trichloroethene	12.6	NA	6
			Total HI (Groundwater—Indoor Air):		**NA**	**504[g]**
		Groundwater (Tap water)	1,3-Dinitrobenzene	2.8	NA	1
			2,6-Dinitrotoluene	1	NA	0.2
			2-Amino-4,6-dinitrotoluene	0.54	NA	0.3
			4-Amino-2,6-dinitrotoluene	1.1	NA	0.6
			HMX	450	NA	0.4
			RDX	940	NA	12
			Arsenic	37	NA	6
			Barium	960	NA	0.3
			Naphthalene	3.2	NA	0.5
			1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	NA	18
			1,1-Dichloroethane	3.5	NA	0.0009
			1,1-Dichloroethene	79	NA	0.3
			Benzene	0.47	NA	0.01
			Bromomethane	8.4	NA	1
			Chloroform	21	NA	0.2
			cis-1,2-Dichloroethene	57	NA	2

Table 5.2-9 Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-3, Attachment 1	Exposure Medium	COPC	WBPA		
				EPC [b]	ELCR	HI
			Dichlorodifluoromethane	230	NA	1
			Ethylbenzene	1.9	NA	0.002
			Trichloroethene	54	NA	19
			Total HI (Groundwater—Tap Water):		**NA**	**63[g]**
	Total HI (Groundwater—Indoor Air and Tap Water):				**NA**	**568[g]**
Hypothetical Resident (Adult/Child Aggregate)	7.12 and 9.12	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2470000	NA	NA
			1,1-Dichloroethene	55.5	NA	NA
			Bromomethane	1.76	NA	NA
			Chloroform	1.93	2E-05	NA
			cis-1,2-Dichloroethene	5.72	NA	NA
			Dichlorodifluoromethane	2490	NA	NA
			Trichloroethene	12.6	3E-05	NA
			Total ELCR (Groundwater—Indoor Air):		**4E-05**	**NA**
		Groundwater (Tap water)	1,3-Dinitrobenzene	2.8	NA	NA
			2,6-Dinitrotoluene	1	2E-05	NA
			2-Amino-4,6-dinitrotoluene	0.54	NA	NA
			4-Amino-2,6-dinitrotoluene	1.1	NA	NA
			HMX	450	NA	NA
			RDX	940	1E-03	NA
			Arsenic	37	7E-04	NA
			Barium	960	NA	NA
			Naphthalene	3.2	3E-05	NA
			1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	NA	NA
			1,1-Dichloroethane	3.5	1E-06	NA

Table 5.2-9 Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-032G: West Burn Pad Area Groundwater, IAAP-003-R-01: West Burn Pads, IAAP-005-R-01: West Burn Pads South of Road
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-3, Attachment 1	Exposure Medium	COPC	WBPA		
				EPC [b]	ELCR	HI
			1,1-Dichloroethene	79	NA	NA
			Benzene	0.47	1E-06	NA
			Bromomethane	8.4	NA	NA
			Chloroform	21	1E-04	NA
			cis-1,2-Dichloroethene	57	NA	NA
			Dichlorodifluoromethane	230	NA	NA
			Ethylbenzene	1.9	1E-06	NA
			Trichloroethene	54	1E-04	NA
			Total ELCR (Groundwater—Tap Water):		**2E-03[h]**	**NA**
	Total ELCR (Groundwater—Indoor Air and Tap Water):				**2E-03[h]**	**NA**

Notes:

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic His were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water) and shallow groundwater (trench) - µg/L; groundwater (indoor air—vapor intrusion) and shallow groundwater (trench air) - µg/m^3

[c] The His for whole body (due to Dichlorodifluoromethane) and NOE (due to 1,1,2-Trichlorotrifluoroethane (Freon 113) exceed 1—Appendix A-3, Attachment 1 (see Tables 9.4 and 10.1).

[d] The His for cardiovascular (due to arsenic and TCE), developmental (due to TCE), immune (due to 1,3 Dinitrobenzene, and TCE), nervous (due to RDX), whole body (due to Dichlorodifluoromethane), and NOE (due to 1,1,2-Trichlorotrifluoroethane (Freon 113) exceed 1—Appendix A-3, Attachment 1 (see Tables 9.5 and 10.2).

[e] The ELCR exceeds 1x10^{-4} (due to Chloroform, TCE, 2,6-Dinitrotoluene, RDX, Arsenic, and Naphthalene)—Appendix A-3, Attachment 1 (see Tables 9.5 and 10.2).

[f] The His for cardiovascular (due to TCE), developmental (due to TCE), immune (due to TCE), exceed 1—Appendix A-3, Attachment 1 (see Tables 9.6 and 10.3).

[g] The His for cardiovascular (due to arsenic and TCE), dermal (due to arsenic), developmental (due to TCE), hepatic (due to 1,1-Dichloroethene, 2-Amino-4,6-dinitrotoluene, 4-Amino-2,6-dinitrotoluene, and HMX), immune (due to 1,3 Dinitrobenzene, and TCE), nervous (due to Bromomethane, RDX, 1,1,2-Trichlorotrifluoroethane (Freon 113) and Naphthalene), respiratory (due to Bromomethane and Naphthalene), whole body (due to Dichlorodifluoromethane), and NOE (due to 1,1,2-Trichlorotrifluoroethane (Freon 113) exceed 1—Appendix A-3, Attachment 1 (see Tables 9.7, 9.8, 10.4, and 10.5).

[h] The ELCR exceeds 1x10^{-4} (due to Chloroform, TCE, 2,6-Dinitrotoluene, RDX, Arsenic, Naphthalene, and 1,1-Dichloroethane)—Appendix A-3, Attachment 1 (see Tables 9.9 and 10.6).

RME = reasonable maximum exposure

Step 4: Final COC Determination

For groundwater potable use by future hypothetical residents, the target organ–specific His exceeded USEPA's threshold of 1 and the cumulative ELCR exceeded USEPA's acceptable risk range (1×10^{-6} to 1×10^{-4}) due to the COPCs indicated below:

Hypothetical Resident		
Groundwater Exposure Pathway	**Chemicals Causing Receptor Target Organ HI > 1**	**Chemicals Causing Receptor ELCR > 1 × 10^{-4}**
Potable use	1,3-dinitrobenzene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, HMX, RDX, arsenic, barium, 1,1,2-trichlorotrifluoroethane (Freon 113), 1,1-dichloroethene, bromomethane, chloroform, cis-1,2-dichloroethene, dichlorodifluoromethane, naphthalene, TCE	2,6-dinitrotoluene, RDX, arsenic, naphthalene, 1,1-dichloroethane, chloroform, TCE
Indoor air (VI)	1,1,2-trichlorotrifluoroethane (Freon 113), 1,1-dichloroethene, bromomethane, dichlorodifluoromethane, TCE	Chloroform, TCE

These chemicals were identified as COCs in groundwater for future hypothetical residents with the exception of one metal (barium) and two VOCs (chloroform and cis-1,2-dichloroethene). Barium and cis-1,2-dichloroethene were detected at concentrations less than their respective MCLs. Concentrations of chloroform, which is a component of total trihalomethanes (bromodichloromethane, bromoform, dibromochloromethane, and chloroform), were below the MCL for total trihalomethanes. Note that chloroform was the only trihalomethane detected in groundwater in 2019–2020. These chemicals were not identified as COCs in groundwater at the WBPA for potable use. However, chloroform was identified as a COC for indoor air (i.e., VI in groundwater).

The federal MCLs for the COCs (potable use) are presented below:

Chemical	Maximum Detected Concentration (µg/L)	MCL (µg/L)	Exceeds MCL?	Groundwater COC for Potable Use Scenario?
1,1,2-Trichlorotrifluoroethane (Freon 113)	180,000	NA	NA	Yes
1,1-Dichloroethane	3.5	NA	NA	Yes
1,1-Dichloroethene	79	7	Yes	Yes
1,3-Dinitrobenzene	2.8	NA	NA	Yes
2,6-Dinitrotoluene	1	NA	NA	Yes
2-Amino-4,6-dinitrotoluene	0.54	NA	NA	Yes
4-Amino-2,6-dinitrotoluene	1.1	NA	NA	Yes
Arsenic	37	10	Yes	Yes
Barium	960	2,000	No	No
Bromomethane	8.4	NA	NA	Yes
Chloroform	21[a]	80[a]	No	No
cis-1,2-Dichloroethene	57	70	No	No
Dichlorodifluoromethane	230	NA	NA	Yes
HMX	450	NA	NA	Yes
Naphthalene	3.2	NA	NA	Yes
RDX	940	NA	NA	Yes

Chemical	Maximum Detected Concentration (µg/L)	MCL (µg/L)	Exceeds MCL?	Groundwater COC for Potable Use Scenario?
TCE	54	5	Yes	Yes

NA = not applicable

[a] The value of 80 µg/L is based on the MCL of total trihalomethanes, which includes the sum of bromodichloromethane, bromoform, dibromochloromethane, and chloroform. The maximum detected concentration for total trihalomethanes at the WBPA is 21 µg/L; chloroform was the only trihalomethane detected in groundwater.

Because COCs were identified for future hypothetical residents, potential exposures and risks and hazards were also estimated for current and future site workers and future construction/utility workers (summarized in Table 5.2-8).

For current and future indoor air (VI of groundwater) and future groundwater (potable use) exposures by site workers, the target organ–specific HIs exceeded USEPA's threshold of 1 and the cumulative ELCR exceeded USEPA's acceptable risk range due to the COPCs indicated below:

Site Workers		
Groundwater Exposure Pathway	**Chemicals Causing Receptor Target Organ HI > 1**	**Chemicals Causing Receptor ELCR > 1 × 10^{-4}**
Potable use	1,3-Dinitrobenzene RDX, arsenic, and TCE	2,6-Dinitrotoluene, RDX, arsenic, chloroform, and TCE
Indoor air (VI)	Dichlorodifluoromethane and 1,1,2-trichlorotrifluoroethane (Freon 113)	Chloroform and TCE

For contact with shallow groundwater by future construction/utility workers, the target organ–specific HIs exceeded USEPA's threshold of 1 and cumulative ELCR exceeded USEPA's acceptable risk range (1 × 10^{-6} to 1 × 10^{-4}) due to the COPCs indicated below:

Construction/Utility Worker		
Groundwater Exposure Pathway	**Chemicals Causing Receptor Target Organ HI > 1**	**Chemicals Causing Receptor ELCR > 1 × 10^{-4}**
Shallow groundwater	TCE	None
Trench air	TCE	None

In summary, the following COCs were identified for groundwater, as presented in Appendix A-3, Attachment 1, tables:

Chemical	Site Workers (Current) (Table 10.1)	Site Workers (Future) (Table 10.2)	Construction/ Utility Workers (Table 10.3)	Hypothetical Residents (Tables 10.4–10.6)
1,1,2-Trichlorotrifluoroethane (Freon 113)	X	X		X
1,1-Dichloroethane				X
1,1-Dichloroethene				X

Chemical	Site Workers (Current) (Table 10.1)	Site Workers (Future) (Table 10.2)	Construction/ Utility Workers (Table 10.3)	Hypothetical Residents (Tables 10.4–10.6)
1,3-Dinitrobenzene		X		X
2,6-Dinitrotoluene		X		X
2-Amino-4,6-dinitrotoluene				X
4-Amino-2,6-dinitrotoluene				X
Arsenic		X		X
Bromomethane				X
Chloroform		X		X
Dichlorodifluoromethane	X	X		X
HMX				X
Naphthalene				X
RDX		X		X
TCE		X	X	X

5.2.6.6 Uncertainty Analysis

The assumptions used in the HHRAs have inherent uncertainty. The general uncertainties associated with the HHRAs for the sites in this RI report are provided in Section 4.3.1. This section provides additional site-specific uncertainties associated with the HHRA for the WBPA that are not included in Section 4.3.1.

The maximum RL of detected chemicals not identified as COPCs in the RAGS Table 2 Series (Appendix A-2, Attachment 1) was compared to their respective RSL. However, chemicals whose RL exceeds the RSL were not identified as COPC. For the WBP, RLs exceeded RSLs for six VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, chloromethane, 1,2-dichloroethene, xylene, m,p-xylene, and o-xylene). Although the RLs for these detected chemicals are greater than the RSLs, based on the frequency of exceedance, probable chemical interference from detected VOCs and comparison to historically detected chemicals in groundwater at IAAAP, further consideration of these detected chemicals does not appear warranted in the WBPA HHRA.

Noncancer hazards exceed USEPA's target HI of 1 for the current site worker scenario for indoor air exposures from VI of COPCs in groundwater. Two COCs were identified for the groundwater VI pathway: Freon 113 (HI = 113) and dichlorodifluoromethane (HI = 6). Several uncertainties associated with VI hazard calculations result in an overestimation of hazard:

- The use of groundwater data to estimate indoor air concentrations may result in overestimation or underestimation of hazard due to the uncertainties in modeling indoor air concentrations from groundwater data and the assumed lack of a vadose zone source which, if present, would also contribute to indoor air concentrations.
- Use of the maximum detected groundwater concentrations as the EPCs likely results in an overestimation of hazards. The VOC plume is located approximately 300 feet north of the currently active Building BG-13 (Figure 5.1-5).

  - Monitoring well WBP-99-2, located approximately 200 feet northeast of BG-13, has a 2019 detection of 20,000 µg/L of Freon 113.
  - Groundwater flow is generally east, towards Spring Creek.
  - Two monitoring wells within 100 feet of BG-13, but south of the building, have concentrations of Freon 113 less than the VISL and nondetected concentrations of dichlorodifluoromethane.
- Use of USEPA's default attenuation factor to calculate the indoor air EPCs for VI from groundwater to indoor air may result in overestimating indoor air concentrations resulting in overly conservative estimates of hazard to building occupants. The default attenuation factor (0.001) incorporated into groundwater screening levels is not based on site-specific subsurface data and does not consider a chemical's soil adsorption characteristics, and reflects reasonable worst-case conditions (i.e., residential structures) and is particularly conservative when used to assess industrial buildings.
- BG-13, which is used as a wash down for explosives-contaminated equipment, is a single-story building that is 28 feet by 48 feet. The building has a concrete foundation and floor (slab on grade), with concrete block wall, and a precast concrete roof. There is no HVAC system in the building; the building is heated by a propane-fueled boiler. The building has a drive-in bay; the rollup door is open when in use and weather is good. A maximum of two operators are in the building, usually one or two times per week but sometimes up to three times per week.
  - Nonhazard estimates are based on an exposure of 250 days per year, 8 hours per day. Because the actual usage of the building is less (approximately 50 to 100 days per year), the hazard estimates are likely overestimated.
  - When the bay rollup door is open, air mixing within the building is increased and indoor air concentrations decreased. The VI calculations used to estimate indoor air concentrations do not take into account increased air mixing, thus overestimating indoor air concentrations and hazards.

Hazard estimates for 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene could be over- or underestimated because screening RfDs were used in the risk calculations. As stated in the PPRTV documents for 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene (USEPA, 2020b, 2020c):

> It is inappropriate to derive a subchronic or chronic provisional RfD for [2-amino-4,6-dinitrotoluene or 4-amino-2,6-dinitrotoluene]. However, information is available which, although insufficient to support derivation of a provisional toxicity value, under current guidelines, may be of limited use to risk assessors.… Users of screening toxicity values in an appendix to a PPRTV assessment should understand that there is considerably more uncertainty associated with the derivation of a supplemental screening toxicity value than for a value presented in the body of the assessment.

Chemicals that were 100 percent not detected in surface water, sediment, and groundwater were not included in the COPC identification process; however, they were evaluated in a separate screening to determine if elevated nondetected results were present in surface water, sediment, or groundwater. The analysis of the nondetected chemicals at the WBPA is provided in Appendix A-3, Attachment 4. In summary, one metal (chromium) and one VOC (1,2,3-trichloropropane) have DLs and/or RLs greater than SLs in surface water. Three explosives (2,4-dinitrotoluene, 2-nitrotoluene, and nitrobenzene), one metal (chromium), three SVOCs (1,2,4-trichlorobenzene, 1,4-dichlorobenzene, and hexachlorobutadiene), and 24 VOCs have RLs and/or DLs exceeding SLs in groundwater. Although the DLs and/or RLs for these nondetect chemicals are greater than the SLs, based on the frequency of exceedance, probable chemical interference from detected VOCs and comparison to historically detected chemicals in groundwater at IAAAP, further consideration of nondetect chemicals does not appear warranted in the WBPA HHRA.

5.2.6.7 Summary of HHRA

An HHRA was prepared for the WBPA to evaluate potential current and future health risks from exposure to chemicals in site surface water, sediment, and groundwater. The WBPA is inactive; two buildings are present at the site but only one building, BG-13, is still active and as of 2012 is used to wash down explosives-contaminated equipment. The site is partially open to recreational activities and hunting is permitted within the site boundary. Spring Creek and perennial tributaries are present within the WBPA site boundary.

The following potential human receptors were identified in the HHRA for the WBPA:

- **Current and Future Hunters/Recreators (Adult and Adolescent).** Current hunters/recreators could be exposed to surface water and sediment in perennial water bodies while hunting and recreating at the WBPA.
- **Current Site Workers.** Current site workers could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in Building BG-13.
- **Future Site Workers.** Future site workers could contact groundwater based on potential future use as a drinking water source at the WBPA and could be exposed to indoor air (if impacted by VOCs migrating from groundwater) in buildings.
- **Future Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert located within the WBPA site.
- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on potential future use as a drinking water source at the WBPA and could be exposed to indoor air (if impacted by VOCs migrating from groundwater) in future buildings.

Potential exposures and risks and hazards to future site workers and construction/utility workers were estimated in the HHRA since estimated risks and hazards for a hypothetical residential scenario exceed acceptable risk and hazard levels and COCs were identified for a residential scenario.

The COPCs (site-related COPCs or naturally occurring chemicals) identified in site media are as follows:

- Surface Water: None.
- Sediment: None.
- Groundwater (potable use):
  - Naturally occurring: cadmium.
  - Site-related: 1,3-dinitrobenzene, 2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, HMX, RDX, arsenic, barium, naphthalene, 1,1,2-trichlorotrifluoroethane (Freon 113), 1,1-dichloroethane, 1,1-dichloroethene, benzene, bromomethane, chloroform, cis-1,2-dichloroethene, dichlorodifluoromethane, ethylbenzene, and TCE.
- Groundwater (vapor intrusion): 1,1,2-trichlorotrifluoroethane (Freon 113), 1,1-dichloroethene, bromomethane, chloroform, cis-1,2-dichloroethene, dichlorodifluoromethane, and TCE.
- Groundwater (trench scenario):
  - Naturally occurring: cadmium.
  - Site-related: 1,3-dinitrobenzene, 2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, HMX, RDX, barium, naphthalene, 1,1,2-trichlorotrifluoroethane (Freon 113), 1,1-dichloroethane, 1,1-dichloroethene, bromomethane, chloroform, cis-1,2-dichloroethene, dichlorodifluoromethane, and TCE.

The risk characterization for the WBPA was completed using a four-step process, as discussed in Section 4.3.1. Step 1 presents the total combined risks and hazards from site-related COPCs and naturally occurring chemicals, as summarized in Table 5.2-7. Step 2 presents the risks and hazards from naturally occurring chemicals, as summarized in Table 5.2-8. Step 3 presents the risks and hazards from site-related COPCs, as summarized in Table 5.2-9.

Unacceptable groundwater risks and hazards were identified in Step 3 for hypothetical residents, and in Step 4, six explosives, one metal, one SVOC, and seven VOCs were identified as COCs for future hypothetical residents. Therefore, groundwater risks and hazards were also estimated for current and future site workers and future construction/utility workers. For current site workers, two VOCs were identified as COCs; for future site workers, three explosives, one metal, and three VOCs were identified as COCs; for future construction/utility workers, one VOC was identified as a COC.

In summary, the following COCs were identified for groundwater:

Current Site Worker	Future Site Worker	Future Construction / Utility Worker	Future Hypothetical Resident
1,1,2-Trichlorotrifluoroethane (Freon 113) Dichlorodifluoromethane	1,1,2-Trichlorotrifluoroethane (Freon 113) 1,3-Dinitrobenzene 2,6-Dinitrotoluene Arsenic Chloroform Dichlorodifluoromethane RDX TCE	TCE	1,1,2-Trichlorotrifluoroethane (Freon 113) 1,1-Dichloroethane 1,1-Dichloroethene 1,3-Dinitrobenzene 2,6-Dinitrotoluene 2-Amino-4,6-dinitrotoluene 4-Amino-2,6-dinitrotoluene Arsenic Bromomethane Chloroform Dichlorodifluoromethane HMX Naphthalene RDX TCE

5.2.7 Ecological Risk Assessment

The ERA for the WBPA is presented herein, beginning with Step 1 of the ERA process (to determine whether there are complete exposure pathways). Soil at the WBPA is already addressed under the remedy for OU-1. Due to the presence of Spring Creek, surface water and sediment show complete exposure pathways. Based on the available habitat, the following exposure pathways are potentially complete:

- Ingestion of biota exposed to surface water or sediment.
- Ingestion of surface water or sediment.
- Dermal contact with surface water or sediment.

However, dermal contact, although a potentially complete pathway, is considered a minor exposure; it is critical to the risk assessment only in specialized cases, such as burrowing receptors, which are not modeled for OU-10.

Groundwater is present onsite, but ecological receptors are not exposed directly to groundwater. However, groundwater is a transport medium, and contaminated groundwater has the potential to migrate to and discharge to surface water bodies. In this ERA, groundwater was not evaluated as a potential transport medium for WBPA-related chemicals to a seep, as there is no significant contamination observed in surface water and sediment samples. The ECEM is presented in Figure 5.2-4.

Surface water and sediment data were evaluated in the 2022 Watershed ERA (Appendix I) for the Spring Creek watershed. From the SLERA, copper and silver in sediment were identified as COPECs; these COPECs were carried forward into the BERA. No chemicals were identified as COPECs in surface water. Following the weight-of-evidence evaluation, no COPECs were identified for Spring Creek. The recommendation of NFA for the Spring Creek watershed based on the results of the Watershed ERA (Appendix I) means that no ecological impacts are expected at the WBPA.

5.2.8 Conclusions and Recommendations

An RI was conducted for the WBPA to refine the nature and extent of contamination in groundwater, surface water, and sediment from historical activities and assess for potentially unacceptable risk to human health and adverse effects to the environment. Analytical data available for groundwater at WBPA includes explosives, VOCs, SVOCs, PAHs, PCBs, pesticides, herbicides, radionuclides, and metals. Analytical data available for surface water and sediment collected form perennial features includes explosives, VOCs, SVOCs, PAHs, PCBs, pesticides, herbicides (surface water only), and metals. In groundwater, only explosives, VOCs, and metals were identified as site-related chemicals of interest based on historical site operations and a comparison of concentration data to site characterization PALs and BTVs. In surface water, only dissolved aluminum was identified as a site-related chemical of interest. No site-related chemicals of interest were identified for sediment (See Section 4.1).

In groundwater, three explosives (RDX, 2,6-DNT, and 1,3-dinitrobenzene), four VOCs (Freon 113, 1,1-dichloroethane, 1,1-DCE, and TCE) and one metal (arsenic) were detected above their respective site characterization PALs or BTVs (if available) during the most recent sampling events. RDX groundwater contamination is present as one large plume, which exists primarily within the overburden and shallow bedrock aquifers. Stable and decreasing RDX concentrations are present to the north and east of the RDX plume; however, some increasing trends may be indicative of some plume migration or rebound following the treatability study injections. However, the slow groundwater flow velocity should be limiting the extent of plume migration. As such, no RDX exceedances have been observed in the most downgradient monitoring wells at the site and no explosives contamination was detected in surface water samples downstream of the WBPA. The RDX plume is considered to be laterally and vertically delineated.

In surface water, only dissolved aluminum was detected above its site characterization PAL and BTV in 2019, downstream of the EDA. Dissolved aluminum was not detected upstream of the EDA in 2019.

The soil removals that were completed in 2001 and between 2008 and 2012 are assumed to have removed the bulk of RDX contamination that could be a source to groundwater. However, confirmation samples collected in 2000 from the four excavation areas (WBP Landfill, Pad 2-W, Burn Cage Ash Landfill, and Pad 1-W) indicated that RDX was still present above OU-1 leachability RGs (ECC, 2001), which could be a continuing source at the WBPA. An HHRA and an ERA were conducted to quantify potential risks and hazards to human health and the environment from exposure to contaminants at the WBPA. The following conclusions were made based on the risk assessments:

- The HHRA concluded that there are no unacceptable risks or hazards for hypothetical residents from exposure to surface water or sediment at the WBPA.
- The HHRA identified potentially unacceptable risks and hazards for the following receptors from exposure to groundwater at the WBPA:

Site Receptor	Chemicals (COCs)
Site Workers (Current)	Freon 113, dichlorodifluoromethane
Site Workers (Future)	Freon 113, 1,3-dinitrobenzene, 2,6-dinitrotoluene, arsenic, chloroform, dichlorodifluoromethane, RDX, TCE
Construction/Utility Workers	TCE
Hypothetical Residents	Freon 113, 1,1-dichloroethane, 1,1-dichloroethene, 1,3-dinitrobenzene, 2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, arsenic, bromomethane, chloroform, dichlorodifluoromethane, HMX, naphthalene, RDX, and TCE

- The ERA concluded that no adverse effects to ecological receptors exist at the WBPA. The Watershed ERA (Appendix I) did not identify any COPECs for Spring Creek.

Based on the results of the RI and risk assessments, additional action is warranted to mitigate potentially unacceptable risks to future receptors from site-related COCs in groundwater (Freon 113, 1,1-dichloroethane, 1,1-DCE, 1,1-DCA, 1,3-dinitrobenzene, 2,6-DNT, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, arsenic, bromomethane, chloroform, dichlorodifluoromethane, HMX, naphthalene, RDX, and TCE). It is recommended that an FS be completed under OU-10 to evaluate remedial alternatives to address the unacceptable risks in groundwater at the WBPA (IAAP-032G). It is recommended that TCE reductive degradation products (such as cis-1,2-DCE and vinyl chloride) be included in the monitoring plans of the FS remedial alternatives. NFA is warranted for surface water and sediment. When developing remedial alternatives, the FS should consider the reasonably foreseeable future land use for this area. In addition, it is recommended that staff gauges EDA-1 through EDA-3 be repaired to obtain accurate groundwater gauging measurements at the site in the future.

5.3 North Burn Pads—Groundwater (IAAP-036G)

This subsection summarizes RI activities at the NBPs site within the EDA. This report documents the RI for groundwater at the NBPs (IAAP-036G). Soil is addressed under the remedy for OU-1 (IAAP-036) (Leidos, 2018). A small reach of an unnamed perennial tributary of Spring Creek flows inside the southwestern boundary of the NBP into the WBPA. Spring Creek flows adjacent to several environmental sites within the EDA (Figure 5.1-1). Surface water and sediment are evaluated at the WBPA (IAAP-032G) (Section 5.2) because it is the site within the EDA containing the largest portion of Spring Creek and perennial tributaries within its boundary. A limited discussion of surface water and sediment within Spring Creek is included in this section to support the CSM for the NBPs.

5.3.1 Background

5.3.1.1 Site Description

The NBPs is an inactive site located in the northeast portion of the IAAAP facility that covers approximately 4 acres within the Spring Creek watershed (Figure 5.1-1). The NBPs are part of a larger area, the EDA.

The NBPs area was used for demilitarization by open burning. The site is fenced and there are no remaining structures onsite. The NBPs previously contained two earthen burning pads designated Pad 1-N (north) and Pad 2-N (south) (Figure 5.1-1). Each burn pad was approximately 20 feet by 50 feet. A former 275-gallon diesel fuel refueling station was present at the base of Pad 2-N. The station consisted of an aboveground storage tank without secondary containment that was used to fuel equipment operating in the EDA. The aboveground diesel storage tank replaced a former underground storage tank, which had been north of former Building 199-2 and was removed in 1991.

5.3.1.2 Operational History

The NBPs were active between 1968 and 1972. Operations at the NBPs consisted of open burning of lead azide and gun powder. Of note is that liquid Freon was used to reduce the sensitivity of lead azide at the IAAAP. The resulting ash residue, as well as flashed cans, containers, and construction debris, was disposed at the NBPLF (see Section 5.4). Historical documents indicate that the Atomic Energy Commission operated in the EDA until 1975 (USACE, 2001); however, the NBPs were not impacted by radiological contamination (USACE, 2008).

Historical documents do not indicate that liquid fuel accelerants were used as part of open burning operations. However, diesel fuel was stored and dispensed onsite (JAYCOR, 1996).

5.3.1.3 Previous Investigations and Remedial Actions

Numerous investigations have been conducted at IAAAP since the 1980s. Table 5.3-1 summarizes the previous investigations and remedial actions conducted at the NBPs, including conclusions and recommendations. Although soil at the NBPs has already been addressed under OU-1, previous investigations for soil are also presented in Table 5.3-1 to support the CSM.

This report summarizes the RI for groundwater at the NBPs (IAAP-036G). Previous investigations pertinent to the RI for groundwater are listed below; additional details on these investigations (including a more detailed description of work completed, as well as work not pertinent to this RI), are included in Table 5.3-1. Previous groundwater sampling locations are shown on Figure 5.1-2.

Investigation	Conclusion
Follow-on Study of Environmental Contamination (Battelle, 1984)	Two surface water samples were collected from Spring Creek upstream and downstream of the EDA and analyzed for explosives. No contamination was found in surface water at the EDA. No additional recommendations were made for the EDA sites.
RCRA Facility Assessment (Ecology and Environment, 1987)	Three sediment samples were collected from the EDA and analyzed for explosives and metals. Significant levels of explosives (RDX, HMX, 1,3,5-TNB, and TNT) were detected. High metals concentrations were found upgradient and downgradient of the site. Heavy metals concentrations upgradient and downgradient of the open burning pit were high. Additional sediment sampling was recommended.
Facility-wide Preliminary Assessment (JAYCOR, 1994)	The Preliminary Assessment indicated there was a potential for contamination at the NBPs, however no specific contamination study had been performed in this area. It was concluded that the overall exposure potential resulting from historical burning activities was low at the NBPs.
Facility-wide Site Inspection (JAYCOR, 1992)	No groundwater samples were collected at the NBPs during the SI. Further investigation was recommended as part of the RI.
Phase I and Follow-on Remedial Investigation (JAYCOR, 1993, 1996)	Four new monitoring wells (JAW-11 through JAW-14) were installed and sampled for metals, explosives, and VOCs. In groundwater, metals and low levels of explosives were the main contaminants observed at the NBPs. No VOCs were detected at the NBPs. The RI recommended semiannual compliance groundwater monitoring at two wells in the NBPs for metals. Surface water and sediment samples were collected from the Spring Creek tributary (RBW-SW/SD-15) south of the NBPs during the RI and analyzed for explosives and metals. High levels of explosives and metals were detected in the tributary samples; however, explosives contaminants were possibly due to surface water runoff from the WBPA since no explosives were detected in soil samples from the NBPs.
Periodic Groundwater and Surface Water Monitoring (multiple reports)	Periodic groundwater and surface water sampling was conducted at the NBPs between 1994 and 2003 as part of the FFA compliance monitoring and groundwater monitoring program. Samples were analyzed for explosives, metals, and/or gross alpha and gross beta parameters. In groundwater between 1994 and 2003, low levels of metals, explosives, and VOCs were detected at NBP wells. Between 2000 and 2003, detections of metals and VOCs were below screening levels. RDX was the only explosive detected above comparison criteria at the NBP. In surface water, RDX was not detected after June 2002. Freon 113 concentrations, which were likely from the WBPA, decreased over the periodic monitoring period.
Supplemental Groundwater Remedial Investigation (MWH, 2001)	Groundwater samples were collected from three existing monitoring wells (JAW-12 through JAW-14) and analyzed for VOCs, SVOCs, explosives, and metals. No contaminants were detected at the NBPs above screening levels.
Baseline Ecological Risk Assessment Sampling (MWH, 2004)	Sediment and surface water samples were collected as part of the BERA and analyzed for metals, explosives, SVOCs, pesticides/PCBs, and herbicides. One surface water and one sediment sample (SC13-H) were collected upstream of the NBPs, one surface water and one sediment sample (SC08-H) were collected near the NBPs, and three surface water and three sediment samples were collected downstream of the EDA (SC09-H, SC10-H, SC11-H). Surface water samples SC13-H and SC08-H had RDX concentrations above screening levels in 2000. No explosives were detected in sediment samples.
Comprehensive Watersheds Evaluation and Supplemental Data Collection Work Plan (Tetra Tech, 2006)	The work plan concluded that no groundwater, surface water, or sediment data gaps were present at the NBPs.

As part of the previous investigations under OU-1, explosives, VOCs, SVOCs, pesticides, PCBs, and metals were identified as soil COCs for the EDA (ECC, 2000). Elevated levels of metals and explosives were identified in soil around former burn pads (ECC, 2000); the former burn pad locations are shown on Figure 5.1-1. To address risks and hazards associated with these COCs, soil removal actions have been conducted at NBPs, and LUCs have been implemented (Leidos, 2019); excavation areas are shown on Figure 5.1-1. Approximately 2,990 cubic yards of contaminated soil was removed from excavations around the two burn pads. Confirmation samples verified that all soil COCs were removed to OU-1 remedial goals, with the exception of RDX. RDX exceeded its leachability remedial goal in one confirmation sample from Pad 1-N at 2.7 mg/kg. The USEPA and USACE approved the backfilling of these excavation areas given that additional removal had been conducted, contaminant concentrations were low, the remaining contamination was deep in the soil profile and would be covered with clean soil, human health and ecological risk would be minimal at the site, and removal of additional soil considering the contaminant depth and low risk potential was not cost-effective (USACE, 2016). Therefore, these areas are not expected to be an ongoing source of RDX to groundwater.

5.3.2 2018–2020 Remedial Investigation Activities

Additional field work was conducted at the NBPs to resolve data gaps needed to complete the RI for groundwater (IAAP-036G). As documented in the final *Site-specific Worksheets for Operable Unit 6 of the Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant (Packet 2*) (CH2M, 2018a), further investigation was warranted to evaluate whether soil contamination around Pad 1-N, where RDX was left in place at a concentration slightly above its OU-1 RG, had impacted groundwater. Furthermore, an improved understanding of current conditions was warranted to complete the RI. To address these data gaps, the installation of one overburden monitoring well was proposed along with groundwater sampling of four existing wells and the newly installed monitoring well. Fieldwork completed at the NBPs was conducted in accordance with the UFP-QAPP (CH2M, 2017a).

Surface water monitoring of Spring Creek was also warranted to assess potential groundwater–surface water interactions (CH2M, 2018a). This field work was conducted under the WBPA investigation and is discussed in Section 5.2.

5.3.2.1 2018–2019 Field Activities

On June 7, 2018, one new overburden monitoring well (NBP-MW1) was installed at the NBPs to meet the data quality objectives (Figure 5.1-2). NBP-MW1 was installed to evaluate whether groundwater had been impacted within the soil removal area at Pad 1-N.

The new monitoring well was drilled with a Geoprobe 6620DT drill rig with 8-inch-outer-diameter augers in accordance with the methods in Section 3.2.3. The boring log is provided in Appendix C. In accordance with the UFP-QAPP, the overburden monitoring well (NBP-MW1) was screened across the perceived water table, from 15 to 25 feet bgs. Well construction details are provided in Table 5.1-2. NBP-MW1 was completed with a 2-inch-nominal-diameter Schedule 40 PVC screen and riser and 0.5-foot Schedule 40 PVC end cap. The monitoring well was screened with a machine-slotted, 0.010-inch, 10-foot screen. The monitoring well was constructed with a certified-clean silica sand filter pack from the base of the borehole to 2 feet above the top of the screen. A 3.5-foot-thick bentonite layer was placed above the filter pack sand and hydrated. The well was grouted to the surface, and a steel stickup well protector was installed and surrounded by three bollards. The well completion diagram is included in Appendix C.

On June 22, 2018, newly installed monitoring well NBP-MW1 was developed as described in Section 3.2.4. NBP-MW1 was purged dry at least once, and approximately six well casing volumes were purged during development. Monitoring well NBP-MW1 was considered developed due to the slow recharge. The well development log is provided in Appendix C.

Groundwater samples were collected from four existing monitoring wells (JAW-11 through JAW-14) and the newly installed one (NBP-MW1) on March 24, 2019. NBP monitoring wells were sampled via low-flow purging and sampling techniques and analyzed for explosives by Method SW8330B. Groundwater samples from JAW-13 were also collected for VOCs by Method SW8260 to support VOC delineation at the WBPA (discussed further in Section 5.2). Purge logs are included in Appendix C. Data were managed and validated as discussed in Section 3.3. Laboratory reports are provided in Appendix B.

All IDW generated during activities (soil and purge water) was disposed of in accordance with management activities discussed in Section 3.2.9. Waste management documentation is provided in Appendix D.

Newly installed monitoring well NBP-MW1 was surveyed by Bruner, Cooper, and Zuck, Inc., licensed Iowa surveyors, on September 24, 2018, in accordance with the methods described in Section 3.2.7. Survey information is included in Appendix E.

5.3.3 Environmental Setting

5.3.3.1 Topography and Surface Water

The topography at the NBPs slopes to the south towards a tributary of Spring Creek. Surface runoff near the NBPs discharges into a tributary of Spring Creek south of Pad 2-N (Figure 5.1-1). This perennial tributary flows east through the WBPA toward Spring Creek.

5.3.3.2 Geology and Hydrogeology

The overburden geology of the NBP area consists of thin and discontinuous loess overlying till. The loess material is typically silty and less than 2 feet thick and was not observed at newly installed well NBP-MW1. The till is primarily sandy clay containing discontinuous localized sand lenses. The overburden overlies the bedrock of the Warsaw Formation. The bedrock is composed of shale and limestone encountered at depths ranging from 19 to below 25 feet bgs near the NBPs. Bedrock was not encountered during drilling at NBP-MW1 to 25 feet bgs.

Groundwater in the overburden is generally encountered between 3 and 22 feet bgs, with the shallowest measurements recorded in the northeastern portions of the NBP area. During the 2019 EDA-wide gauging event, groundwater was measured between 7 and 19 feet bgs (Table 5.1-3). Based on recent and historical groundwater gauging, overburden groundwater flows to the southeast towards Spring Creek and the tributary to Spring Creek (Figure 5.1-3). Hydraulic gradients range from 0.038 to 0.091 ft/ft. Hydraulic conductivity values were calculated from slug tests and range from 0.0015 to 8.6 ft/day in the overburden (Tetra Tech, 2012).

5.3.4 Nature and Extent of Contamination

This subsection describes the nature and extent of groundwater contamination at the NBPs. A small reach of an unnamed perennial tributary of Spring Creek flows inside the southwestern boundary of the NBP into the WBPA. However, because the largest portion of Spring Creek and perennial tributaries are present within the WBPA site boundary, surface water and sediment are evaluated under that IAAAP site (IAAP-032G). Surface water and sediment data near the NBPs is also discussed to support the fate and transport evaluation. Similarly, although soil has been addressed under OU-1, it is discussed briefly to inform the CSM for potential groundwater contaminants.

The source of contamination at the NBPs is attributed to releases to the surface as a result of historical site operations, including open burning of lead azide and gunpowder (JAYCOR, 1996). Incomplete combustion of explosives compounds and metals from ash released to soil may have leached into groundwater.

5.3.4.1 Groundwater

Groundwater samples have been collected at the NBPs since 1993. Five active monitoring wells are present at the NBPs. Four of the wells are screened in the overburden to depths ranging from 7 to 29 feet bgs; one well (JAW-14) is screened in shallow bedrock from 18 to 28 feet bgs (Figure 5.1-1). Historical groundwater samples were analyzed for analyzed for VOCs, SVOCs, explosives, metals, PAHs, and radionuclides. No PAHs were detected in historical groundwater samples, and SVOCs have not been detected in groundwater sampled since 1995 at the NBPs. Based on historical site operations and COCs identified in soil, explosives, VOCs, and metals are considered chemicals of interest in groundwater at the NBPs; however, metals and VOCs have been detected below screening criteria since 2000.

Samples were collected from all five NBP monitoring wells during the most recent RI activities, in 2019, and analyzed for explosives (Figure 5.1-4). Monitoring well JAW-13 was also analyzed for VOCs to address the data quality objectives for the WBPA (Section 5.2). Table 5.3-2 summarizes the chemicals detected in groundwater during the 2000–2019 sampling events at the NBPs. Summary tables of all the analytical results (including nondetects) from the 2018–2020 RI activities are provided in Appendix G. Summary tables of all historical analytical results from the NBPs are provided in Appendix H.

VOCs

Three VOCs (Freon 113, bromomethane, and chloroform) have been detected in groundwater at JAW-13 since 2000 (Table 5.3-2). The Freon 113 concentration detected at JAW-13 in 2019 was 2,000 µg/L, below the site characterization PAL (10,000 µg/L). This well is located near the southern boundary of the NBPs. No VOCs have been detected above their respective site characterization PALs at the NBPs.

Explosives

Between 2000 and 2020, five explosives (MNX, 3-nitrotoluene, 4-amino-2,6-DNT, HMX, and RDX) were detected at the NBPs (Table 5.3-2). No explosives were detected above their respective site characterization PALs at the NBPs during this time period. MNX does not have a site characterization PAL. Historically, only RDX has exceeded its site characterization PAL of 2 µg/L at one location (JAW-14), at a concentration of 2.1 µg/L (Appendix H). During the most recent sampling event in 2019, RDX was not detected at any of the five wells at the NBPs.

Metals

Eight metals have been detected in groundwater at the NBPs since 2000; however, no metals were detected above their site characterization PALs or BTVs. Concentrations of some metals may be naturally elevated in the environment, and may not indicate a CERCLA-regulated release. Several metals (such as barium, calcium, chromium, lead, magnesium, selenium, silver, and sodium) were detected below their BTVs during the latest sampling events and are therefore considered to be naturally occurring in groundwater at the NBPs.

5.3.4.2 Sediment and Surface Water

There is a small section of a perennial Spring Creek tributary that runs just inside the southern boundary of the NBPs. The tributary flows into the northern portion of the WBPA and into Spring Creek (Figure 5.1-1). Spring Creek and its perennial tributaries are located predominantly within the WBPA, and therefore these surface water features are discussed in more detail in Section 5.2. However, to support the CSM for the NBPs, the nature and extent of RDX in surface water and sediment samples that are near the NBPs are discussed in this subsection.

Figure 5.1-6 shows surface water and sediment samples that have been collected from the EDA for explosives analysis. Summary tables of historical analytical results are provided in Appendix H. RDX was detected in sample SCT1 in 2002; however, it was not detected in this location during subsequent sampling events, in 2003 and 2004 (Table 5.2-3). During the 2018–2020 RI sampling event, surface water samples were collected upstream (EDA-SW03) and downstream (EDA-SW02) of the EDA and analyzed for explosives (Table 5.2-3). RDX was not detected in any of the upstream or downstream surface water samples. As described above, no contaminants that would discharge into surface water were detected in groundwater at the NBPs above their site characterization PALs.

5.3.5 Fate and Transport

Neither explosives nor VOCs were detected in groundwater above their site characterization PALs during the most recent sampling event (2019). Metals were also not detected above their PAL or BTVs during the most recent sampling event (2003). Therefore, no chemicals of interest have been identified for fate and transport discussion at the NBPs based on a comparison of data to the site characterization PALs. Human health COPCs are identified in Section 5.3.6 in accordance with methods described in Section 4.

NBP-MW1 was installed downgradient of Pad 1-N, where low levels of RDX contamination above the OU-1 leachability RGs had been left in place. RDX was not detected in groundwater at this location; therefore, this location is not likely contributing to groundwater contamination.

5.3.6 Human Health Risk Assessment

An HHRA was prepared for the NBPs to evaluate potential current and future health risks and hazards from exposure to chemicals in site groundwater. Soil media within the NBPs is not included in the HHRA as it not a component of this RI; the soil RI was conducted under OU-1 (IAAP-036). A brief summary of OU-1 soil COCs is provided in Section 5.3.1.3 and historical remedial activities for soil are presented in Table 5.3-1. A very small reach of an unnamed perennial tributary of Spring Creek flows inside the southwestern boundary of the NBPs into the WBPA; however, surface water and sediment media are not included in this HHRA and are addressed with the WBPA HHRA (see Section 5.2.6).

The HHRA was conducted in accordance with the final UFP-QAPP (CH2M, 2017a), with the exception of some deviations that were agreed to during meetings or correspondence with USACE and USEPA following approval of the final UFP-QAPP. The approach and method used to conduct the HHRA are provided in Section 4.3.1. This section presents the CEM for the NBPs and provides the results of the four-step evaluation process comprising the following:

- Data evaluation.
- Exposure assessment.
- Toxicity assessment.
- Risk characterization.

The results of the HHRA are used to determine whether further action is warranted for groundwater at the NBP.

5.3.6.1 Conceptual Exposure Model

A description of the NBPs, their operational history, previous investigations, and remedial actions is provided in Sections 5.3.1 and 5.3.2. The soil at the NBPs is addressed under the remedy for OU-1 (IAAAP Site IAAP-036) (Leidos, 2018) and was not reevaluated in this HHRA.

The NBP is an inactive site that consisted of two earthen burn pads for open burning of lead azide and gunpowder. The EDA is fenced, and there are no remaining structures onsite. The site is closed to recreational activities; therefore, hunting is not permitted within the site boundary. There is a very small reach of an unnamed perennial surface water feature within the NBP site boundary; however, it flows into the WBPA, and therefore surface water and sediment are evaluated with the WBPA HHRA (see Section 5.2.6). There are culverts located at the NBPs; therefore, pathway for potential groundwater exposures by construction/utility workers is complete.

Groundwater is not currently being used as a potable water source and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the NBP is classified as Class IIB, a potential source of drinking water (USEPA, 1989). Therefore, the HHRA for the NBPs evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future residential exposures to groundwater.

There are no potentially complete exposure pathways under current site conditions. The following potential future human receptors were identified in the HHRA for the NBPs:

- **Future Site Workers.** Future site workers could contact groundwater based on its potential future use as a drinking water source at the NBPs and could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in buildings.

- **Future Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert located within the NBPs.

- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on potential future use as a drinking water source at the NBPs and could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in buildings.

As discussed in Section 4.3.1, potential exposures and risks and hazards to future site workers and construction/utility workers are estimated in the HHRA only if the estimated risks and hazards for a hypothetical residential scenario exceed acceptable risk levels and COCs are identified for a residential scenario. The human health CEM presenting potential exposure media, exposure points, receptors, and exposure routes is provided in Appendix A-4 Attachment 1 (Table 1) and depicted graphically on Figure 5.3-1.

5.3.6.2 Data Evaluation

Data Used in the HHRA

The analytical data used in the HHRA consisted of groundwater samples collected at the NBPs. Groundwater samples collected from 2002 and 2003 and more recent samples, collected in 2019, were used in the HHRA for the NBPs. Historical groundwater samples were analyzed for explosives, metals, and one SVOC (1,4-oxathiane, which was nondetect at all locations). Recent groundwater samples were analyzed for explosives, one PAH (which was all nondetects), SVOCs (which were all nondetects), and VOCs. The analytical data for explosives and SVOCs from 2002 and 2003 were not included in the HHRA because data were available from the 2019 sampling event. As stated in the UFP-QAPP (CH2M, 2017), "Older data (i.e., data collected prior to 2012) may be used in the human health risk assessments if they are still representative of the site (i.e., groundwater flow is slow), chemicals have properties where there would not be a significant reduction in concentrations over time (e.g., metals), or data are conservative for site conditions." The NBPs are no longer operational, as described in Section 5.3.1. Potential soil sources to groundwater have been remediated, as described in Section 5.3.1.3. Due to a lack of continuing sources, historical concentrations in groundwater are expected to have remained stable or even decreased due to natural attenuation processes. Therefore, the assumptions in the final UFP-QAPP still hold. Samples collected prior to 2012 are considered representative of, or more conservative than, current conditions at the NBPs.

Eleven groundwater samples were used to evaluate potential exposures for both a potable use scenario and the VI pathway. The groundwater samples were not collected at multilevel wells; therefore, a separate data grouping (based on shallow groundwater only) was not used to evaluate the VI pathway. A separate groundwater data grouping was used to evaluate a construction/utility worker scenario, assuming construction/utility workers could be exposed to shallow groundwater (encountered at depths up to 10 feet bgs). Four groundwater samples were used to evaluate potential exposures in a trench for a construction/utility worker.

A summary of the number of chemicals analyzed and detected in groundwater is presented below:

Chemical Group	Number of Chemicals Analyzed	Number of Chemicals Detected
Groundwater		
Explosives	17	2
Metals	8	4
PAHs	1	0
SVOCs	5	0
VOCs	61	3

A description of the data groupings and samples included in the HHRA are provided in Tables 5.3-3 and 5.3-4, respectively. The analytical dataset used in the HHRA is included as Appendix A-4, Attachment 2. The groundwater sampling locations included in the HHRA are depicted on Figure 5.1-11.

Screening Results for Site-related Chemicals of Potential Concern and Naturally Occurring Chemicals

The approach and SLs used to select the COPCs (site-related COPCs or naturally occurring chemicals) are described in Section 4.3.1. The results of the COPC screening process for a future site worker and hypothetical resident potentially exposed to groundwater are provided in Appendix A-4, Attachment 1 (Tables 2.1 and 2.2), and those for a future construction/utility worker potentially exposed to groundwater in a trench are provided in Appendix A-4, Attachment 1 (Table 2.3). The tap water RSL for hexavalent chromium was used in the COPC screening process for total chromium because the groundwater samples collected at the NBPs were not analyzed for hexavalent chromium. The COPCs (site-related COPCs or naturally occurring chemicals) identified in site groundwater are summarized in the tables below.

Summary of COPCs for the NBP—Site-Related

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Groundwater Used for Tap Water				
Future Site Worker and Future Hypothetical Resident	1,1,2-Trichlorotrifluoroethane (Freon 113)	1 / 1	2000	2000
Groundwater to Indoor Air via Vapor Intrusion				
Future Site Worker and Future Hypothetical Resident	1,1,2-Trichlorotrifluoroethane (Freon 113)	1 / 1	2000	2000

Summary of COPCs for the NBP—Naturally Occurring Chemicals

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Groundwater Used for Tap Water				
Future Site Worker and Future Hypothetical Resident	Chromium	4 / 6	0.62	2.4
Shallow Groundwater in a Trench (<10 ft bgs)				
Future Construction / Utility Worker	Chromium	1 / 2	2.4	2.4

5.3.6.3 Exposure Assessment

NBP is an inactive site. There is a very small reach of an unnamed perennial tributary of Spring Creek within the NBP site boundary; however, potential exposures to surface water and sediment are addressed in the WBPA HHRA (Section 5.2.6). The site is closed to recreational activities; therefore, hunting is not permitted within the site boundary.

As previously discussed, groundwater is not being used as a potable water source; however, the HHRA for the NBPs evaluated potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future residential exposures to groundwater. Therefore, ingestion and dermal contact exposures to COPCs in groundwater were estimated for future hypothetical residents. Additionally, inhalation exposures to site groundwater were also evaluated for hypothetical residents, assuming VOCs could be present in household air as a result of showering, bathing, and other household activities. The vapor intrusion pathway is also considered potentially complete for groundwater if future industrial buildings or residences are constructed at the NBP; therefore, potential inhalation exposures to indoor air were evaluated for hypothetical residents. Culverts are located at the NPBs; therefore, potential ingestion, dermal contact, and inhalation exposures to shallow groundwater in a trench were evaluated for future construction/utility workers.

As discussed in Section 4.3.1, the hypothetical resident is protective of all other activities; therefore, potential exposures and risks and hazards to future site workers and construction/utility workers are estimated in the HHRA only if the estimated risks and hazards for a hypothetical residential scenario exceed acceptable risk and hazard levels and COCs are identified for a residential scenario. The potential exposure pathways quantified in the HHRA are included in Appendix A-4, Attachment 1 (Table 1), and shown on Figure 5.3-1. The following receptor scenarios were quantified in the HHRA for the NBP:

- Future Site Worker
  - Groundwater (tap water) COPCs—ingestion and dermal contact
  - Groundwater (vapor intrusion) COPCs—inhalation of volatiles in indoor air
- Future Construction/Utility Worker
  - Shallow groundwater (trench, 0 to 10 feet bgs) COPCs—incidental ingestion and dermal contact
- Future hypothetical residents (adult and child)
  - Groundwater (tap water) COPCs—ingestion, dermal contact, and inhalation of volatiles in household air

– Groundwater (vapor intrusion) COPCs—inhalation of volatiles in indoor air

Risks and hazards for site workers and construction/utility workers were quantified in the HHRA because the estimated risks or hazards for a hypothetical residential scenario exceeded acceptable risk or hazard levels and COCs were identified for a residential scenario.

In accordance with *Determining Groundwater Exposure Point Concentrations, Supplemental Guidance* (USEPA, 2014b), groundwater EPCs are typically calculated based on the data collected in the core of a plume. However, based on available site data, no plumes are present. Therefore, all results in the groundwater dataset were used to calculate the EPCs for the COPCs in groundwater. For groundwater, fewer than eight samples were available in the data groupings used to evaluate a potable use scenario, the vapor intrusion pathway, and a trench scenario. Therefore, the maximum detected concentration was selected as the EPC for each COPC. The groundwater EPCs used to estimate the chemical intakes for each exposure scenario are provided in Appendix A-4, Attachment 1 (Tables 3.1 through 3.3).

The exposure factors used in the intake calculations for future receptor scenarios are included in Appendix A-4, Attachment 1 (Tables 4.1 through 4.3). The primary references for the exposure factor values are the standard default exposure factors presented in the HHEM (USEPA, 2014a).

5.3.6.4 Toxicity Assessment

The oral toxicity values (CSFs and RfDs) and inhalation toxicity values (IURs and RfCs) used in the HHRA were obtained from the USEPA standard hierarchy of toxicity value sources (USEPA, 2003), as provided in Section 4.3.1. Noncancer toxicity values for the COPCs identified at the NBPs are provided in Appendix A-4, Attachment 1 (Tables 5.1 and 5.2). Cancer toxicity values for the COPCs are provided in Appendix A-4, Attachment 1 (Tables 6.1 and 6.2).

One COPC (chromium, evaluated as hexavalent chromium in the HHRA) was identified as acting with a MMOA. The ADAFs and exposure assumptions used to calculate adjusted intakes and exposure concentrations for chromium are provided in Appendix A-4, Attachment 1 (Table 4 Supplement).

5.3.6.5 Risk Characterization

The risk characterization for NBP was completed using a four-step process, as discussed in Section 4.3.1. The results of each step are discussed below.

Step 1: Total Combined Risks and Hazards from Site-Related COPCs and Naturally Occurring Chemicals

Step 1 consists of calculating receptor-specific ELCRs and HIs that include contributions from both site-related COPCs and naturally occurring chemicals. The estimated risks and hazards for a hypothetical residential scenario are summarized below in Table 5.3-5.

Table 5.3-5. Summary of Total Combined Risk and Hazard Estimates for Site-Related COPCs and Naturally Occurring Chemicals—IAAP-036G: North Burn Pads Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-4, Attachment 1	Exposure Medium	COPC/Chemical	NBP		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.1 and 9.1	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	27400	NA	5
			Total HI (Groundwater—Indoor Air):		**NA**	**5**
		Groundwater	Chromium	2.4	NA	0.03

Table 5.3-5. Summary of Total Combined Risk and Hazard Estimates for Site-Related COPCs and Naturally Occurring Chemicals—IAAP-036G: North Burn Pads Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

<table>
<tr><th rowspan="2">Receptor [a]</th><th rowspan="2">ELCR/HI Tables (RME) in Appendix A-4, Attachment 1</th><th rowspan="2">Exposure Medium</th><th rowspan="2">COPC/Chemical</th><th colspan="3">NBP</th></tr>
<tr><th>EPC [b]</th><th>ELCR</th><th>HI</th></tr>
<tr><td rowspan="3"></td><td></td><td>(Tap water)</td><td>1,1,2-Trichlorotrifluoroethane (Freon 113)</td><td>2000</td><td>NA</td><td>0.2</td></tr>
<tr><td colspan="4">Total HI (Groundwater—Tap Water):</td><td>NA</td><td>0.2</td></tr>
<tr><td colspan="4">Total HI (Groundwater—Indoor Air and Tap Water):</td><td>NA</td><td>5</td></tr>
<tr><td rowspan="6">Hypothetical Resident (Child)</td><td rowspan="4">7.2 and 9.2</td><td rowspan="2">Groundwater (Indoor Air)</td><td>1,1,2-Trichlorotrifluoroethane (Freon 113)</td><td>27400</td><td>NA</td><td>5</td></tr>
<tr><td colspan="2">Total HI (Groundwater—Indoor Air):</td><td>NA</td><td>5</td></tr>
<tr><td rowspan="2">Groundwater (Tap water)</td><td>Chromium</td><td>2.4</td><td>NA</td><td>0.05</td></tr>
<tr><td>1,1,2-Trichlorotrifluoroethane (Freon 113)</td><td>2000</td><td>NA</td><td>0.2</td></tr>
<tr><td colspan="4">Total HI (Groundwater—Tap Water):</td><td>NA</td><td>0.2</td></tr>
<tr><td colspan="4">Total HI (Groundwater—Indoor Air and Tap Water):</td><td>NA</td><td>5</td></tr>
<tr><td rowspan="6">Hypothetical Resident (Adult/Child Aggregate)</td><td rowspan="4">7.3 and 9.3</td><td rowspan="2">Groundwater (Indoor Air)</td><td>1,1,2-Trichlorotrifluoroethane (Freon 113)</td><td>27400</td><td>NA</td><td>NA</td></tr>
<tr><td colspan="2">Total ELCR (Groundwater—Indoor Air):</td><td>NA</td><td>NA</td></tr>
<tr><td rowspan="2">Groundwater (Tap water)</td><td>Chromium</td><td>2.4</td><td>6E-05</td><td>NA</td></tr>
<tr><td>1,1,2-Trichlorotrifluoroethane (Freon 113)</td><td>2000</td><td>NA</td><td>NA</td></tr>
<tr><td colspan="4">Total ELCR (Groundwater—Tap Water):</td><td>6E-05</td><td>NA</td></tr>
<tr><td colspan="4">Total ELCR (Groundwater—Indoor Air and Tap Water):</td><td>6E-05</td><td>NA</td></tr>
</table>

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (indoor air)—µg/m³, groundwater (tap water)—µg/L

µg/L = microgram per liter
µg/m³ = microgram per cubic meter
COPC = chemical of potential concern
ELCR = excess lifetime cancer risk
EPC = exposure point concentration
HI = hazard index
NA = not applicable
RME = reasonable maximum exposure

Step 2: Risk Characterization of Naturally Occurring Chemicals

Step 2 consists of calculation of receptor-specific ELCRs and HIs for naturally occurring chemicals. One COPC (chromium) was identified as a naturally occurring chemical in site groundwater at the NBP, as discussed in Section 5.3.4. The maximum detected concentration of chromium in groundwater was less than its BTV. The estimated risks and hazards for the naturally occurring chemical in groundwater for a future hypothetical residential scenario are provided below in Table 5.3-6. The naturally occurring chemical is not used to identify the final COCs for the NBPs and is not discussed further in the HHRA after this step.

Table 5.3-6. Summary of Risk and Hazard Estimates for Naturally Occurring Chemicals—IAAP-036G: North Burn Pads Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-4, Attachment 1	Exposure Medium	Chemical	NBP		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.4 and 9.4	Groundwater (Tap water)	Chromium	2.4	NA	0.03
	Total HI (Groundwater—Tap Water):				**NA**	**0.03**
Hypothetical Resident (Child)	7.5 and 9.5	Groundwater (Tap water)	Chromium	2.4	NA	0.05
	Total HI (Groundwater—Tap Water):				**NA**	**0.05**
Hypothetical Resident (Adult/Child Aggregate)	7.6 and 9.6	Groundwater (Tap water)	Chromium	2.4	6E-05	NA
	Total ELCR (Groundwater Tap Water):				**6E-05**	NA

Notes:

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water)—µg/L

µg/L = microgram per liter

COPC = chemical of potential concern

ELCR = excess lifetime cancer risk

EPC = exposure point concentration

HI = hazard index

NA = not applicable

RME = reasonable maximum exposure

Step 3: Risk Characterization of Site-related COPCs

Step 3 consists of calculating receptor-specific ELCRs and HIs associated with site-related COPCs. One site-related COPC (1,1,2-trichlorotrifluoroethane [Freon 113]) was identified for groundwater at NBP. The estimated risks and hazards for 1,1,2-trichlorotrifluoroethane) in groundwater for a future site worker and hypothetical resident are provided below in Table 5.3-7. An ELCR could not be estimated for 1,1,2-trichlorotrifluoroethane) because oral and dermal CSFs have not been established for it, based on the hierarchy of toxicity sources used in the HHRA (USEPA, 2003).

Table 5.3-7. Summary of Risk and Hazard Estimates for Site-Related COPC—IAAP-036G: North Burn Pads Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-4, Attachment 1	Exposure Medium	COPC	NBP EPC [b]	NBP ELCR	NBP HI
Site Worker	7.7 and 9.7	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	27400	NA	1
			Total ELCR and HI (Groundwater—Indoor Air):		**NA**	**1**
		Groundwater (Tap water)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	NA	0.0006
			Total ELCR and HI (Groundwater—Tap Water):		**NA**	**0.0006**
	Total ELCR and HI (Groundwater—Indoor Air and Tap Water):				**NA**	**1**
Hypothetical Resident (Adult)	7.8 and 9.8	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	27400	NA	5
			Total HI (Groundwater—Indoor Air):		**NA**	**5[c]**
		Groundwater (Tap water)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	NA	0.2
	Total HI (Groundwater—Tap Water):				**NA**	**0.2**
	Total HI (Groundwater—Indoor Air and Tap Water):				**NA**	**5[c]**
Hypothetical Resident (Child)	7.9 and 9.9	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	27400	NA	5
			Total HI (Groundwater—Indoor Air):		**NA**	**5[c]**
		Groundwater (Tap water)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	NA	0.2
	Total HI (Groundwater—Tap Water):				**NA**	**0.2**
	Total HI (Groundwater—Indoor Air and Tap Water):				**NA**	**5[c]**
Hypothetical Resident (Adult/Child Aggregate)	7.10 and 9.10	Groundwater (Indoor Air)	1,1,2-Trichlorotrifluoroethane (Freon 113)	27400	NA	NA
			Total ELCR (Groundwater—Indoor Air):		**NA**	**NA**
		Groundwater (Tap water)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	NA	NA
	Total ELCR (Groundwater—Tap Water):				**NA**	**NA**
	Total ELCR (Groundwater—Indoor Air and Tap Water):				**NA**	**NA**

Notes:

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (indoor air)—µg/m^3, groundwater (tap water)—µg/L

[c] The HI for NOE (due to 1,1,2- Trichlorotrifluoroethane [Freon 113]) exceeds 1—Appendix A-4, Attachment 1 (see Table 9.8 and Table 9.9).

µg/L = microgram per liter

µg/m^3 = microgram per cubic meter

COPC = chemical of potential concern

ELCR = excess lifetime cancer risk

EPC = exposure point concentration

HI = hazard index

NA = not applicable

NOE = No Observable Effects

RME = reasonable maximum exposure

Step 4: Final COC Determination

For groundwater (vapor intrusion) exposures by future hypothetical residents, one target organ–specific HI ("no observed effects") exceeded USEPA's threshold of 1. The 1,1,2-trichlorotri-fluoroethane (Freon 113) groundwater (vapor intrusion) EPC for the future hypothetical resident was 27,400 µg/L. The HI for the hypothetical resident was 5; 1,1,2-trichlorotri-fluoroethane (Freon 113), which was identified as a COC in groundwater for future hypothetical residents (see Appendix A-4, Attachment 1 [Tables 10.1 and 10.2]). Therefore, potential exposures and risks and hazards were also estimated for future site workers (summarized in Table 5.3-7).

For exposures to groundwater (potable use and vapor intrusion) by future site workers, the cumulative HI, which was equal to 1 did not exceed the USEPA's acceptable HI of 1, and no COCs were identified for this receptor.

The final COCs are summarized in the table below.

Final Groundwater COCs

Future Hypothetical Resident		Future Site Worker	
Tap Water	**Indoor Air via Vapor Intrusion**	**Tap Water**	**Indoor Air via Vapor Intrusion**
None	1,1,2-Trichlorotrifluoroethane (Freon 113)	None	None

5.3.6.6 Uncertainty Analysis

The assumptions used in the HHRAs have inherent uncertainty. The general uncertainties associated with the HHRAs for the sites in this RI report are provided in Section 4.3.1. This section provides additional site-specific uncertainties associated with the HHRA for the NBPs that are not included in Section 4.3.1.

Total chromium was initially identified as a COPC in groundwater because the maximum detected concentration for total chromium exceeded the tap water RSL for hexavalent chromium. It is likely that some or all of the total chromium concentrations are in the trivalent chromium form. All of the groundwater chromium concentrations are less than the tap water RSL for trivalent chromium and the MCL and BTV for total chromium. Using the hexavalent chromium RSL to evaluate total chromium in the COPC selection process was a conservative approach in the HHRA. Total chromium was determined to be naturally occurring in groundwater at the NBPs.

Chemicals that were 100 percent not detected in an exposure medium were not included in the COPC identification process; however, they were evaluated in a separate screening to determine whether elevated nondetected results were present in site media. The analysis of the nondetected chemicals at the NBP is provided in Appendix A-4, Attachment 3. In summary, four explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene), one metal (arsenic), one PAH (naphthalene), two SVOCs (1,4-dichlorobenzene and hexachlorobutadiene), and 14 VOCs have RLs and/or DLs exceeding SLs at the NBP. Although the DLs and/or RLs for these nondetected chemicals are greater than the SLs, based on the acceptably low DLs and RLs, further consideration of nondetected chemicals does not appear warranted in the NBP HHRA.

5.3.6.7 Summary of HHRA

An HHRA was prepared for the NBPs to evaluate potential future health risks from exposure to chemicals in site groundwater. The NBPs is an inactive site. The site is closed to recreational activities, and therefore hunting is not permitted within the site boundary. There is a very small reach of an unnamed perennial tributary of Spring Creek within the NBP site boundary, and potential exposures to this surface water feature are evaluated in the WBPA HHRA (Section 5.2.6).

The following potential future human receptors were identified in the HHRA for the NBPs:

- **Future Site Workers.** Future site workers could contact groundwater based on potential future use as a drinking water source at the NBPs and could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in buildings.

- **Future Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert located within the NBPs.

- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on its potential future use as a drinking water source at NBPs and could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in buildings.

Potential exposures and risks and hazards to future site workers and construction/utility workers were estimated in the HHRA only if the estimated risks and hazards for a hypothetical residential scenario exceed acceptable risk and hazard levels and COCs were identified for a residential scenario.

The COPCs (site-related COPCs or naturally occurring chemicals) identified in site groundwater are as follows:

- Groundwater (potable):
  - Naturally occurring: chromium.
  - Site-related: 1,1,2-trichlorotrifluoroethane (Freon 113).
- Groundwater (vapor intrusion): 1,1,2-trichlorotrifluoroethane (Freon 113).

The risk characterization for the NBPs was completed using a four-step process as discussed in Section 4.3.1. Step 1 presents the total combined risks and hazards[6] from site-related COPCs and naturally occurring chemicals, as summarized in Table 5.3-5. Step 2 presents the risks and hazards from naturally occurring chemicals, as summarized in Table 5.3-6. Step 3 presents the risks and hazards from site-related chemicals, as summarized in Table 5.3-7.

[6] In Steps 1 and 2 of the risk characterization, chromium (total) concentrations were assumed to be hexavalent chromium due to the lack of speciated data.

Unacceptable groundwater hazards were identified in Step 3 for hypothetical residents based on the potential vapor intrusion pathway, and in Step 4, 1,1,2-trichlorotrifluoroethane (Freon 113) was identified as a potential vapor intrusion COC for future hypothetical residents. However, the current and expected future Land Use of the NBPs is Commercial/Industrial so future VI exposures to residents is not likely or realistic. Because a COC was identified for hypothetical residents, groundwater risks and hazards were also estimated for future site workers. No COCs were identified for future site workers.

In summary, the following COCs were identified for groundwater:

Future Site Worker	Future Hypothetical Resident
None	1,1,2-Trichlorotrifluoroethane (Freon 113)

5.3.7 Ecological Risk Assessment

The ERA for groundwater at the NBPs is presented herein, beginning with Step 1 of the ERA process (to determine whether there are complete exposure pathways). Soil at the NBPs is already addressed under the remedy for OU-1. While a perennial tributary of Spring Creek runs just inside the southern boundary of the site; surface water and sediment from this feature were evaluated during the watershed ERA (Appendix I). A summary of the ERA conclusions for Spring Creek and its perennial tributaries is provided in the ERA for the WBPA (Section 5.2.7).

Groundwater is present onsite, but ecological receptors are not exposed directly to groundwater; nevertheless, groundwater is a transport medium, and contaminated groundwater has the potential to migrate to and discharge to surface water bodies. Other than the small portion of the Spring Creek tributary than runs through the NBPs (and is evaluated under the WBPA site), there is a lack of perennial surface water bodies on the NBPs. Therefore, the groundwater-to-surface-water exposure pathway is incomplete. There are no complete exposure pathways for ecological receptors on the site. Therefore, there are no adverse effects identified and no additional actions are required from an ecological perspective.

5.3.8 Conclusions and Recommendations

An RI was conducted for the NBPs to refine the nature and extent of contamination in groundwater from historical activities and assess for potentially unacceptable risk to human health and adverse effects to the environment. Analytical data available for groundwater at NBPs includes data for explosives, VOCs, SVOCs, PAHs, radionuclides, and metals. Of these, explosives, VOCs, and metals were identified as site-related chemicals of interest based on historical site operations and a comparison of concentration data to site characterization PALs and BTVs (See Section 4.1).

In groundwater, no VOCs, explosives, or metals were detected above their site characterization PAL or BTV (if available) during the most recent sampling events. Freon 113 was detected in groundwater in one well; however, concentrations were below the site characterization PAL, which differs from the screening value used for HHRA. This well (JAW-13) is located near the southern boundary of the NBPs and may represent the northern edge of VOCs observed in groundwater at the WBPA (Section 5.2). During the most recent sampling event in 2019, RDX was not detected at any wells at the NBPs. Given the lack of RDX in groundwater during the current RI, the soil removal that was completed in 1998 is assumed to have removed RDX contamination that could be a source to groundwater.

An HHRA and an ERA were conducted to quantify potential risks to human health and the environment from exposure to contaminants at the NBPs. The following conclusions were made based on the risk assessments:

- The HHRA identified potentially unacceptable risks for the following media and receptors:

  - **Future Hypothetical Residents.** For groundwater, potentially unacceptable risks and hazards were identified from exposure to 1,1,2-trichlorotrifluoroethane (Freon 113) through a potential vapor intrusion pathway. Therefore, this analyte was identified as a potential vapor intrusion COC for future hypothetical residents. However, the current and expected future Land Use of the IAAAP is Commercial/Industrial so future exposures to residents is not likely.
  - **Future Site Workers.** No potentially unacceptable risks or hazards were identified for exposure to groundwater.
- The ERA concluded that there are no adverse effects to ecological receptors identified and no additional actions are required from an ecological perspective.

Based on the results of the RI and risk assessments, additional action is warranted to mitigate potentially unacceptable risks to future receptors from the site-related COC (Freon 113) in groundwater at the NBPs. It is recommended that an FS be conducted under OU-10 to evaluate remedial alternatives to address the unacceptable risks in groundwater at the NBPs (IAAP-036G). When remedial alternatives are developed, the FS should consider ongoing site operations and the reasonably foreseeable future land use for this area.

5.4 North Burn Pads Landfill—Groundwater (IAAP-037G)

This subsection summarizes RI activities at the NBPLF site within the EDA. This report documents the RI for groundwater at the NBPLF (IAAP-037G). Soil is addressed under the remedy for OU-1 (IAAP-037) (Leidos, 2018). There are no perennial surface water features within the NBPLF, however Spring Creek flows adjacent to several environmental sites within the EDA (Figure 5.1-1). Because the largest portion of Spring Creek and perennial tributaries are within the WBPA site boundary, risk assessment of surface water and sediment is evaluated under that IAAAP site (IAAP-032G) (Section 5.2).

5.4.1 Background

5.4.1.1 Site Description

The NBPLF is an approximately 3-acre site located in the northeast portion of the IAAAP facility, within the Spring Creek watershed (Figure 5.1-1). The NBPLF is part of a larger area, the EDA. It is located just north of the CWP site (IAAP-024), which is addressed in the OU-12 RI report.

The NBPLF consists of a former landfill measuring 60 by 470 feet that was capped with clay, after the contents of the landfill were removed, as part of a cleanup operation in 1980 (JAYCOR, 1992; ECC, 2000). One building, BG-199-4, is present at the NBPLF and is currently used as a breakroom for AO staff. Additional activities at this site include disposal in dumpsters of slightly contaminated explosives waste approved by USEPA (USEPA, 1983, 2001b) and RCRA 90-day hazardous waste storage of paint filters (contaminated with aluminum epoxy paint), which are shipped offsite for disposal at approved facilities (USEPA, 2018a).

5.4.1.2 Operational History

The NBPLF was active between 1968 and 1972. Operations at the NBPLF consisted of the disposal of ash residue from NPBs' burning operations (see Section 5.3), as well as flashed cans, containers, and construction debris. Historical documents indicate that the Atomic Energy Commission used the EDA until 1975 (USACE, 2001); however, the NBPs were not impacted by radiological contamination (USACE, 2008).

5.4.1.3 Previous Investigations and Remedial Actions

Numerous investigations have been conducted at IAAAP since the 1980s. Table 5.4-1 summarizes the previous investigations and remedial actions conducted at the NBPLF, including conclusions and recommendations. Although soil at the NBPLF has already been addressed under OU-1, previous investigations for soil are also presented in Table 5.4-1 to support the CSM.

This report summarizes the RI for groundwater at the NBPLF (IAAP-037G). Previous investigations pertinent to the RI for groundwater are listed below; additional details on these investigations (including a more detailed description of work completed, as well as work not pertinent to this RI), are included in Table 5.4-1. Previous groundwater sampling locations are shown on Figure 5.1-2.

Investigation	Conclusion
Follow-on Study of Environmental Contamination (Battelle, 1984)	Two surface water samples were collected from Spring Creek, upstream and downstream of the EDA, and analyzed for explosives. No contamination was found in surface water at the EDA. No additional recommendations were made for the EDA sites.

Investigation	Conclusion
RCRA Facility Assessment (Ecology and Environment, 1987)	Three sediment samples were collected from the EDA and analyzed for explosives and metals. Significant levels of explosives (RDX, HMX, 1,3,5-TNB, and TNT) were detected. High metals concentrations were found upgradient and downgradient of the site. Heavy metals concentrations upgradient and downgradient of the open burning pit were high. Additional sediment sampling was recommended.
Facility-wide Preliminary Assessment (JAYCOR, 1994)	The Preliminary Assessment indicated there was a potential for contamination at the NBPLF; however, no specific contamination study had been performed in this area. It was concluded that the potential for overland contaminant migration may exist via the intermittent ravine north of the landfill. Removal actions that have taken place led to the conclusion that contaminant migration or exposure is low at the NBPLF.
Facility-wide Site Inspection (JAYCOR, 1992)	No groundwater samples were collected at the NBPLF during the SI. Three sediment samples were collected within the tributary north of the NBPLF. Several metals were detected in all the sediment samples. Chromium and selenium were detected slightly above their screening levels but were within background levels. No explosives were reported in any of the SI samples above their screening levels. No further investigation was recommended as part of the RI.
Phase I and Follow-on Remedial Investigation (JAYCOR, 1993, 1996)	Although the SI recommended no further investigation of the NBPLF, groundwater investigation was completed per USEPA request. Three new monitoring wells (JAW-625 through JAW-627) were installed and sampled for metals, explosives, SVOCs, and VOCs during follow-on work. In groundwater, explosives and metals were detected in all three monitoring wells. The highest levels of explosives were detected in JAW-626 (HMX at 11.2 µg/L). Chromium was reported at the highest levels, 13.2 µg/L, at JAW-627. VOCs were detected in only one upgradient monitoring well (JAW-625). No compliance monitoring was recommended at the NBPLF.
Periodic Groundwater and Surface Water Monitoring (multiple reports)	Periodic groundwater and surface water sampling was conducted at the NBPLF between the 1996 and 2008 as part of the FFA compliance monitoring and groundwater monitoring program. Samples were analyzed for metals, explosives, and/or gross alpha and gross beta parameters. During the last periodic sampling event, in 2008, only one groundwater sample was collected from JAW-627 and analyzed for RDX. In groundwater between 2000 and 2008, metals were detected below screening levels. RDX was the only explosive at the NBPLF to exceed its screening level (2 µg/L) at JAW-627.
Supplemental Groundwater Remedial Investigation (MWH, 2001)	Groundwater samples were collected from three existing monitoring wells (JAW-625 through JAW-627) and analyzed for VOCs, SVOCs, explosives, and metals. RDX was detected in two monitoring wells (JAW-625 and JAW-627) above its screening level.
Baseline Ecological Risk Assessment Sampling (MWH, 2004)	Sediment and surface water samples were collected as part of the BERA and analyzed for metals, explosives, SVOCs, pesticides, PCBs, and herbicides. One surface water and one sediment sample (SC13-H) were collected upstream of the NBPLF, one surface water and one sediment sample (SC08-H) downstream of the NBPLF, and three surface water and three sediment samples downstream of the EDA (SC09-H, SC10-H, SC11-H). Surface water samples SC13-H and SC08-H had RDX concentrations above screening levels in 2000. No explosives were detected in sediment samples.
Comprehensive Watersheds Evaluation and Supplemental Data Collection Work Plan (Tetra Tech, 2006)	The work plan concluded that no groundwater, surface water, or sediment data gaps were present at the NBPLF.

During the 1980 landfill closure, all contents of the landfill were removed to the Inert Disposal Area (JAYCOR, 1992). No known sampling was conducted at that time.

As part of the previous investigations under OU-1, explosives, VOCs, SVOCs, pesticides, and metals were identified as soil COCs for the EDA (ECC, 2000). Elevated levels of metals and explosives were identified in soil around former landfill (ECC, 2000); the former landfill area is shown on Figure 5.1-1. To address risks and hazards associated with these COCs, soil removal actions have been conducted at NBPLF, and LUCs have been implemented (Leidos, 2019); excavation areas are shown on Figure 5.1-1. Approximately 13,890 cubic yards of contaminated soil was removed from excavations around the former landfill. Confirmation samples verified that all soil COCs were removed to OU-1 remedial goals, with the exception of RDX. RDX exceeded its leachability remedial goal in one confirmation sample from the NBPLF at 2.5 mg/kg. The USEPA and USACE approved the backfilling of the excavation area given that contaminant concentrations were low, the remaining contamination was deep in the soil profile and would be covered with clean soil, human health and ecological risk would be minimal at the site, and removal of additional soil considering the contaminant depth and low risk potential was not cost-effective (USACE, 2016).

5.4.2 2018–2020 Remedial Investigation Activities

Additional field work was conducted at the NBPLF to resolve data gaps needed to complete the RI for groundwater (IAAP-037G). As documented in the final *Site-specific Worksheets for Operable Unit 6 of the Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant (Packet 2*) (CH2M, 2018a), the explosives plume required further horizontal and vertical delineation, particularly around JAW-627. In addition, an improved understanding of current conditions was warranted to complete the RI. To address these data gaps, the installation of two overburden monitoring wells and three bedrock monitoring wells was proposed along with groundwater sampling of three existing wells and the newly installed monitoring wells. Fieldwork completed at the NBPLF was conducted in accordance with the UFP-QAPP (CH2M 2018a).

As discussed in the final UFP-QAPP (CH2M, 2018a), surface water monitoring of Spring Creek was also warranted to assess potential groundwater and surface water interactions. This field work was conducted under the WBPA investigation and is included in Section 5.2.

5.4.2.1 2018–2019 Field Activities

Between June 5 and July 18, 2018, one new bedrock monitoring well (NBPLF-MW3) and one new overburden monitoring well (NBPLF-MW5) were installed at the NBPLF to meet the data quality objectives (Figure 5.1-2). Installation of two additional overburden locations (NBPLF-MW2 and NBPLF-MW7) were attempted; however, the locations were dry and no wells were installed. Two additional bedrock wells (NBPLF-MW4 and NBPLF-MW6) were installed in April 2020, as discussed in Section 5.4.2.2.

Station ID	Groundwater Unit	Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Rationale
NBPLF-MW2a	Overburden	27	Dry, no well installed.	To horizontally delineate overburden groundwater conditions east of the former landfill.
NBPLF-MW3	Bedrock	68	57–67	To vertically delineate RDX in bedrock groundwater associated with JAW-627 and east of the former landfill, as detailed in Section 5.4.2.2.

Station ID	Groundwater Unit	Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Rationale
NBPLF-MW4	Bedrock	35	24.5–34.5	To horizontally delineate RDX in bedrock groundwater associated with JAW-627, as detailed in Section 5.4.2.2.
NBPLF-MW5	Overburden	49	39–49	To delineate groundwater contamination adjacent to (north of) the former landfill and Building BG-199-4, as detailed in Section 5.4.2.2.
NBPLF-MW6	Bedrock	38	26.5–36.5	To horizontally delineate bedrock groundwater north of JAW-627.
NBPLF-MW7	Overburden	31	Dry, no well installed.	New location attempted to vertically delineate RDX in overburden groundwater associated with JAW-627, as detailed in Section 5.4.2.2.

New monitoring wells were drilled via rotosonic drilling techniques with a MiniSonic drill rig and 6-inch drill rods (overburden) and wireline (bedrock) or with a Geoprobe 6620DT drill rig with 6- and 8-inch-outer-diameter augers (shallow overburden) in accordance with the methods outlined in Section 3.2.3. Boring logs are provided in Appendix C. All proposed overburden monitoring well locations were drilled to bedrock. Bedrock monitoring well locations were drilled to depths between 35 and 68 feet bgs, consistent with the UFP-QAPP (CH2M, 2018a).

As summarized in the table above, groundwater was not present in the overburden to the northeast (proposed NBPLF-MW2, NBPLF-MW7), and only one new monitoring well (NBPLF-MW5) could be installed within this aquifer unit. In accordance with the UFP-QAPP, the overburden monitoring well (NBPLF-MW5) was screened across the perceived water table, just above bedrock. Well construction details are provided in Table 5.1-2. NBPLF-MW5 was completed with a 2-inch-nominal-diameter Schedule 40 PVC screen and riser and 0.5-foot Schedule 40 PVC end cap. The monitoring well was screened with a machine-slotted, 0.010-inch, 10-foot screen. The monitoring well was constructed with a certified-clean silica sand filter pack from the base of the borehole to 2 feet above the top of the screen. A 3-foot-thick bentonite layer was placed above the filter pack sand and hydrated. The well was grouted to the surface, and a steel stickup well protector was installed and surrounded by three bollards. Well completion diagrams are included in Appendix C.

Only one bedrock monitoring well, NBPLF-MW3, was installed in 2018. This bedrock monitoring well boring was cored to 68 feet bgs to look for groundwater presence in the bedrock cores. Based on field observations (such as fracture frequency and moisture content), the bedrock well was screened across intervals that were the mostly likely to produce groundwater. Once the screen interval was selected, the borings were reamed with 6-inch drill rods via sonic drilling techniques to the identified monitoring well depth. Well construction details are provided in Table 5.1-2. Bedrock monitoring well NBPLF-MW3 was completed with a 2-inch-nominal-diameter Schedule 40 PVC screen and riser and 0.5-foot Schedule 40 PVC end cap. NBPLF-MW3 was screened with a machine-slotted, 0.010-inch, 10-foot screen. Centralizers were installed at the base of and just above the screened interval, at 67 and 57 feet bgs. The monitoring well was constructed with a certified-clean silica sand filter pack from the base of the reamed borehole to 2 feet above the top of the screen. A 4-foot-thick bentonite layer was placed above the filter pack sand and hydrated. The well was grouted to the surface, and a steel stickup well protector was installed and surrounded by three bollards. Well completion diagrams are included in Appendix C.

Between June 19 and August 20, 2018, newly installed monitoring wells NBPLF-MW3 and NBPLF-MW5 were developed as described in Section 3.2.4. Both NBPLF-MW3 and NBPLF-MW5 were purged dry at least once, and over three well casing volumes were purged during development. Both NBPLF-MW3 and NBPLF-MW5 were considered developed due to the slow recharge. The well development logs are provided in Appendix C.

Groundwater samples were collected from three existing NBPLF monitoring wells (JAW-626, JAW-627, and NBPLF-MW1), one existing CWP monitoring well (CW-P), and one newly installed monitoring well (NBPLF-MW5) on June 24 and 25, 2018. Newly installed monitoring well NBPLF-MW3 was sampled on March 25, 2019. NBPLF monitoring wells were sampled via low-flow purging and sampling techniques or by purging three well casing volumes and analyzed for explosives by Method SW8330B. Purge logs are included in Appendix C. Data were managed and validated as discussed in Section 3.3. Laboratory reports are provided in Appendix B.

All IDW generated during activities (soil and purge water) was disposed of in accordance with management activities discussed in Section 3.2.9. Waste management documentation is provided in Appendix D.

Newly installed monitoring wells NBPLF-MW3 and NBPLF-MW5 were surveyed by Bruner, Cooper, and Zuck, Inc., licensed Iowa surveyors, on September 24, 2018, in accordance with methods in Section 3.2.7. Existing monitoring well JAW-627 was resurveyed on December 17, 2019, to confirm the well location. Survey information is included in Appendix E.

5.4.2.2 Deviations and Follow-on Field Activities (2020)

The final UFP-QAPP (Packet 2) (CH2M, 2018a) proposed the installation of five new monitoring wells (two overburden and three bedrock wells) to delineate the explosives plumes at the NBPLF, particularly around the former landfill and around JAW-627. However, during the 2018 field activities, it was noted that JAW-627 was incorrectly located on the site figures. Therefore, only three out of the five proposed monitoring wells were attempted until the location of JAW-627 could be confirmed. JAW-627 was resurveyed on December 17, 2019, and was confirmed to be located east-southeast of the where it was previously assumed to be. Of note is that NBPLF-MW5 was installed where JAW-627 was originally believed to be (just north of the former landfill and Building BG-199-4) to provide groundwater data from beneath the former landfill. A new overburden location, NBPLF-MW7, was drilled adjacent to JAW-627 to meet the initial objectives of vertically delineating RDX in overburden groundwater associated with JAW-627. However, this location was dry, and no monitoring well was installed. This did not impact the results of the RI since the lack of groundwater in the overburden provides the necessary conceptual site model information.

To meet the final data quality objectives, proposed wells NBPLF-MW4 and NBPLF-MW6 were relocated south and north of JAW-627, respectively, to provide horizontal delineation. JAW-627, screened 27.5 to 37.5 feet bgs, is designated a shallow bedrock monitoring well. NBPLF-MW3, screened 57 to 67 feet bgs, was installed in 2018 adjacent to JAW-627 and provides vertical delineation. New bedrock monitoring wells (NBPLF-MW4 and NBPLF-MW6) were drilled via rotosonic techniques with a MiniSonic drill rig and 6-inch drill rods in accordance with methods outlined in Section 3.2.3. The borings were drilled to between 35 and 38 feet bgs, which is a depth similar to that of JAW-627. The boring logs are provided in Appendix C. The relocation of wells NBPLF-MW4 and NBPLF-MW6 did not impact the results of the RI since the new locations were selected to provide the necessary conceptual site model information.

Bedrock monitoring well borings for NBPLF-MW4 and NBPLF-MW6 were cored to look for groundwater presence in the bedrock cores. Based on field observations (such as, fracture frequency and moisture content), the bedrock well was screened across intervals that were the mostly likely to produce groundwater and to match JAW-627. Well construction details are provided in Table 5.1-2. Bedrock monitoring wells were completed with a 2-inch-nominal-diameter Schedule 40 PVC screen and riser and 0.5-foot Schedule 40 PVC end cap. Wells were screened with a machine-slotted, 0.010-inch, 10-foot screen. The monitoring wells were constructed with a certified-clean silica sand filter pack from the base of the reamed borehole to 1.5–2 feet above the top of the screen. A 3- to 3.5-foot-thick bentonite layer was placed above the filter pack sand and hydrated. The well was grouted to the surface, and a steel stickup well protector was installed and surrounded by three bollards. Well completion diagrams are included in Appendix C.

On April 18, 2020, newly installed monitoring wells NBPLF-MW4 and NBPLF-MW6 were developed in accordance with methods outlined in Section 3.2.4. NBPLF-MW6 was purged dry after approximately 2.5 well casing volumes were extracted, and the well was considered developed due to the slow recharge. NBPLF-MW4 was developed once parameters were stabilized and approximately 7.5 well casing volumes were extracted. Well development logs are provided in Appendix C.

Groundwater samples were collected from newly installed monitoring well, NBPLF-MW4 via low-flow purging and sampling techniques on April 20, 2020. NBPLF-MW6 was purged dry, and a groundwater sample was collected once the well had recharged on April 21, 2020. The groundwater samples were analyzed for explosives by Method SW8330B. Data were managed and validated as discussed in Section 3.3. Laboratory reports are provided in Appendix B.

All IDW generated during activities (soil and purge water) was disposed of in accordance with management activities discussed in Section 3.2.9. Waste management documentation is provided in Appendix D. Newly installed monitoring wells NBPLF-MW4 and NBPLF-MW6 were surveyed by Bruner, Cooper, and Zuck, Inc., licensed Iowa surveyors, on June 2, 2020, in accordance with methods outlined in Section 3.2.7. Survey information is included in Appendix E.

5.4.3 Environmental Setting

5.4.3.1 Topography and Surface Water

The topography at the NBPLF slopes to the east and north towards Spring Creek. Surface drainage near the NBPLF is through intermittent tributaries that channel surface water flow eastward into Spring Creek. The western portion of the site contains an asphalt parking lot on the south side of Building BG-199-4, while the eastern portion of the side is vegetated.

5.4.3.2 Geology and Hydrogeology

The overburden geology of the NBPLF consists of glacial till overburden. The till is primarily sandy clay containing discontinuous localized sand lenses. The overburden overlies the bedrock of the Warsaw Formation. The bedrock is composed of shale and limestone encountered at depths ranging from 19 to below 49 feet bgs near the NBPLF. Bedrock appears to be undulating at the NBPLF and is observed shallower in the eastern portion of the site than in the west and central portions of the site.

Groundwater in the overburden and shallow bedrock is generally encountered between 1 and 10 feet bgs, with the shallowest measurements recorded in the eastern portions of the NBPLF. Groundwater appears to be present under both unconfined (in the eastern portion of the NBPLF) and confined (in the western portion of the NBPLF) conditions. During the 2019 EDA-wide gauging event, shallow groundwater was measured between 11 and 21 feet bgs (Table 5.1-3). Deep groundwater occurs at depths ranging from approximately 11 to 34 feet bgs and was measured at approximately 33 feet at NBPLF-MW3 in 2019. NBPLF-MW4 and NBPLF-MW6 were not gauged during the sitewide event, as these locations were not yet installed. However, during sampling, depth to water was measured at 33 feet btoc (Table 5.1-5). Proposed monitoring well, NBPLF-MW2, was drilled to refusal at approximately 31 feet bgs and was dry, indicating groundwater is predominantly within the shallow bedrock in the northeast portion of this site.

The groundwater potentiometric surface in monitoring wells at the NBPLF vary due to the different aquifer zones that individual wells are screened in and the variable thicknesses of the overburden and transition zone to bedrock across this area. As a result, groundwater elevation contours were not drawn across the NBPLF (Figure 5.1-3). However, the groundwater flow direction at the NBPLF can be estimated by reviewing the groundwater elevations across the larger EDA area and considering the influence of Spring Creek on shallow groundwater flow. Based on recent and historical groundwater gauging across the EDA, overburden groundwater at the NBPLF is assumed to flow towards Spring Creek, primarily in east and southeast directions (Figure 2-2 and Figure 5.1-3). Hydraulic horizontal gradients were not measured in 2019 at the NBPLF; however, historical gradients have measured between 0.038 and 0.091 ft/ft at the NBPLF. Hydraulic conductivity values were calculated from slug tests and ranged from 0.0015 to 8.6 ft/day in the overburden (Tetra Tech, 2012). Based on 2019 groundwater elevations, a downward vertical gradient of -0.05 ft/ft was observed at the well pair JAW-627 (shallow bedrock) and NBPLF-MW3 (deep bedrock); groundwater elevations are provided on Table 5.1-3.

Historical gauging data indicate periodic discharge of groundwater to surface water is possible, as indicated by the elevation of periodic surface water in the intermittent tributary to the east of JAW-626 (Tetra Tech, 2012). During the 2019 gauging event, this tributary was dry.

5.4.4 Nature and Extent of Contamination

This subsection describes the nature and extent of groundwater contamination at the NBPLF. There are no perennial surface water features at the NBPLF. Similarly, although soil has been addressed under OU-1, it is discussed briefly to inform the CSM for potential groundwater contaminants. The source of contamination at the NBPLF is attributed to releases to the surface and subsurface as a result of historical site operations, including historical burial of waste within the NBPLF (JAYCOR, 1996).

Groundwater samples have been collected at the NBPLF since 1995. Seven active monitoring wells are present at the NBPLF. In addition, one monitoring well (CW-P) located at the CWP (IAAP-024) has also been monitored during NBPLF investigations due to its proximity to the site. Five of the wells are screened in the overburden to depths ranging from 7.5 to 49 feet bgs, and three wells are screened in bedrock from 24.5 to 68 feet bgs (Figure 5.1-1). Historical groundwater samples were analyzed for analyzed for VOCs, SVOCs, explosives, metals, PAHs, pesticides, and radionuclides. No PAHs, PCBs, pesticides, or SVOCs were detected in historical groundwater samples. Based on historical site operations and COCs identified in soil, explosives, VOCs, and metals are considered chemicals of interest in groundwater at the NBPLF; however, metals and VOCs have been detected below screening criteria since 1995. No VOCs have been detected at the NBPLF since 2000. Additionally, gross alpha and gross beta were detected below their MCLs (15 pCi/L and 50 pCi/L, respectively) in 1999 and 2000 at the NBPLF.

Samples were collected from all seven NBPLF monitoring wells and one CWP monitoring well (CW-P) during the most recent RI activities, in 2018 through 2020, and analyzed for explosives (Figure 5.1-4). Table 5.4-2 summarizes the chemicals detected in groundwater between 2000 and 2020 sampling events at the NBPLF. Summary tables of all the analytical results (including nondetects) from the 2018–2020 RI activities are provided in Appendix G. Summary tables of all historical analytical results from the NBPLF are provided in Appendix H.

Explosives

Between 2000 and 2020, seven explosives (MNX, 1,3-dinitrobenzene, 4-amino-2,6-DNT, TNX, DNX, HMX, and RDX) were detected at the NBPLF (Table 5.4-2). All explosives were detected below their respective site characterization PALs, except for RDX. During the latest sampling events, in 2018 through 2020, RDX exceeded its site characterization PAL at three locations (JAW-627, NBPLF-MW4, and NBPLF-MW6).

RDX contamination is present as two small plumes at the NBPLF. The largest plume is located along the eastern boundary of the site. During the current RI, in 2018, the maximum RDX concentrations were detected at deep overburden well JAW-627, at 14 µg/L (Figure 5.1-4). RDX concentrations in groundwater at the NBPLF decrease with depth and RDX was not detected in the adjacent bedrock well, NBPLF-MW3. Of note, RDX was also not detected in surface water samples collected in 2018 as part of this RI, which are due northeast and southeast of the NBPLF (Figure 5.1-6), which indicates that this eastern plume is defined and not impacting surface water. The second RDX plume is isolated and defined by the RDX that was historically detected at overburden well JAW-625. Low-level concentrations above the PAL (ranging between 4.7 µg/L and 9.5 µg/L) were detected at that location. JAW-625 was abandoned in 1998 during the soil removal action at the NBPLF. RDX was not detected in nearby NBPLF-MW1 during the current RI (2018–2020). Therefore, RDX concentrations in this second plume may have attenuated below the site characterization PAL.

Metals

Nine metals have been detected in groundwater at the NBPLF since 2000; however, no metals were detected above their site characterization PALs or BTVs. Concentrations of some metals may be naturally elevated in the environment, and may not indicate a CERCLA-regulated release. Several metals (such as cadmium and chromium) were detected below their BTVs during the latest sampling events and are therefore considered to be naturally occurring in groundwater at the NBPLF. During the most recent sampling event in 2004, antimony was reported in one well (JAW-626) at a low concentration of 4.1 B µg/L (Appendix H), just above the BTV (2.2 µg/L). However, the B qualifier indicates that antimony was also detected in the associated method and/or calibration blank, and this monitoring well concentration is likely biased high. Antimony was detected below its BTV during previous sampling events; therefore, antimony is considered to be naturally occurring at the NBPLF.

5.4.5 Fate and Transport

This section discusses the fate and transport of site-related chemicals of interest at the NBPLF. This includes chemicals that were detected above both their site characterization PAL and BTV (if available), during the last sampling event that those chemicals were analyzed. In groundwater, the only potential site-related chemical of interest is RDX. Fate and transport characteristics for this chemical were described in Section 3.2.

The NBPLF was formerly used for disposal of ash residue from NPBs' burning operations, as well as flashed cans, containers, and construction debris. The site is no longer an active landfill and is currently used for temporary waste storage, including of slightly contaminated explosives waste, which is placed in dumpsters and shipped offsite for disposal at approved facilities. Building BG-199-4 is located in place of the former landfill and surrounded by an asphalt parking lot. The eastern portion of the site is vegetated and sloped to the east, toward Spring Creek. Surface water drainage occurs through a number of intermittent drainage ditches that ultimately discharge to Spring Creek.

The source of contamination at the NBPLF is attributed to unintended releases to the surface and subsurface as a result of historical site operations, including landfill operations. Contaminants in groundwater have been transported from the source release areas through advection and dispersion. Groundwater generally flows southeast towards Spring Creek (Figure 5.1-3). Historical hydraulic gradients have been measured from 0.038 to 0.091 ft/ft at the NBPLF. Hydraulic conductivity values were calculated from slug tests and range from 0.0015 to 8.6 ft/day in the overburden (Tetra Tech, 2012). Vertical migration at the site is also limited by the generally tight clay lithology in the overburden and a decrease of fractures in bedrock with depth.

One RDX plume is present at the NBPLF east of the former landfill and is restricted to within the shallow bedrock. A second RDX plume, had been located around abandoned monitoring well JAW-625; however, RDX concentrations may have attenuated since the 1998 soil removal action. JAW-625 was abandoned during the removal action, but RDX has not been detected in monitoring well NBPLF-MW1, which was installed to replace this monitoring point (Figure 5.4-1).

Natural attenuation mechanisms that are potentially active at the NBPLF were evaluated. Natural attenuation includes various physical, chemical, or biological processes that under favorable conditions act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. A weight-of-evidence approach was used for this evaluation.

- The primary line of evidence that attenuation is occurring at a site is reduction over time in contaminant concentrations or mass, or both. Explosives were detected above their site characterization PALs in only three shallow bedrock monitoring wells during the latest sampling events (JAW-627, NBPLF-MW4, and NBPLF-MW6), east of the former landfill. RDX concentrations at JAW-627 have been increasing since 2001 (Figure 5.4-1). The highest concentrations of RDX were detected at this well during the most recent monitoring event, in 2018 (Figure 5.4-1). This increase in concentrations may indicate that residual contamination is present at the site that is providing a source to this plume, or that the plume has migrated. The other two monitoring wells with exceedances, NBPLF-MW4 and NBPLF-MW6, were installed in 2020 and do not have trend data available. Nevertheless, concentrations in these two wells were low (< 5 µg/L), and the lack of RDX exceedances in adjacent monitoring wells (overburden well JAW-626 and deep bedrock well NBPLF-MW3) samples suggests that any plume migration is limited.
- Most anaerobic daughter products of RDX were nondetected at NBPLF in 2018 through 2020. However, low levels (< 2 µg/L) of MNX were detected at monitoring wells NBPLF-MW4 and NBPLF-MW6 in 2020, providing evidence that anaerobic biodegradation of RDX may be occurring at the NBPLF.
- Water quality parameters can be used to evaluate whether the geochemical conditions are conducive to biodegradation. During the current RI, groundwater in the impacted monitoring wells in the RDX plume (JAW-627, NBPLF-MW4, and NBPLF-MW6) were observed to be under aerobic and oxidizing conditions, except at NBPLF-MW3, a deep bedrock monitoring well where low DO and negative ORP were observed. DO concentrations were reported in groundwater between 2.09 and 7.39 mg/L and ORP values were reported generally above +65 mV (Tables 5.1-5). pH values were relatively neutral (between 6 and 7), which is favorable for biological activity. Under these geochemical conditions, anaerobic biodegradation of explosives, particularly RDX, would be less favorable. However, the presence of an anerobic RDX daughter product (MNX) indicates that anaerobic biodegradation has occurred to some level. RDX is also subject to abiotic degradation.
- The physical natural attenuation processes are also likely helping to stabilize the plumes, given the limited extent and small size of the plumes. While the RDX in groundwater has moderate solubility and relatively low sorption potential, it should be retarded somewhat as it sorbs to the clay geology. The decreasing thickness of the overburden aquifer in this eastern portion of the site may also be a factor that is limiting plume migration. RDX has limited volatility (Table 4.2-1) and therefore is unlikely to volatilize into soil gas at the water table interface.

5.4.6 Human Health Risk Assessment

An HHRA was prepared for the NBPLF to evaluate potential current and future health risks and hazards from exposure to chemicals in site groundwater. Soil media within the NBPLF is not included in the HHRA as it is not a component of this RI; soil is addressed under the remedy for OU-1 (IAAP-037) (Leidos, 2018). A brief summary of OU-1 soil COCs is provided in Section 5.4.1.3 and historical remedial activities for soil are presented in Table 5.4-1. The NBPLF is open to recreational activities and hunting is permitted within the site boundary. However, there are no perennial surface water features within the NBPLF.

The NBPLF HHRA was conducted in accordance with the final UFP-QAPP (CH2M, 2017a), with the exception of some deviations that were agreed to during meetings or correspondence with USACE and USEPA following approval of the final UFP-QAPP. The approach and methods used to conduct the HHRA are provided in Section 4.3.1. This section presents the CEM for the NBPLF and provides the results of the four-step evaluation process comprising the following:

- Data evaluation.
- Exposure assessment.
- Toxicity assessment.
- Risk characterization.

The results of the HHRA are used to determine whether further action is warranted for groundwater at the NBPLF.

5.4.6.1 Conceptual Exposure Model

A description of the NBPLF, its operational history, previous investigations, and remedial actions are provided in Sections 5.4.1 and 5.4.2.

The NBPLF is located approximately 800 feet north of the NBPs and consists of a former landfill measuring 60 by 470 feet that was capped with clay during cleanup operations in 1980 (ECC, 2000). One building, BG-199-4, is present at the NBPLF and is currently used as a breakroom for AO staff. Additional activities at this site include waste disposal in dumpsters of slightly contaminated explosives-contaminated waste approved by USEPA (USEPA, 1983, 2001c) and RCRA 90-day hazardous waste storage of paint filters (contaminated with aluminum epoxy paint), which are shipped offsite for disposal at approved facilities (USEPA, 2018a). Culverts are not present at the site; therefore, potential groundwater exposures by future construction/utility workers are not complete at the NBPLF.

Groundwater is not currently being used as a potable water source, and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the NBPLF is classified as Class IIB, a potential source of drinking water (USEPA, 1989). Therefore, the HHRA for the NBPLF evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future residential exposures to groundwater.

The following potential current and future human receptors were identified in the HHRA for the NBPLF:

- **Current Site Workers.** Current site workers could be exposed to indoor air (if volatile chemicals are present in groundwater and migrate to indoor air) in Building BG-199-4.
- **Future Site Workers.** Future site workers could contact groundwater based on potential future use as a drinking water source at the NBPLF and could be exposed to indoor air (if volatile chemicals are present in groundwater and migrate to indoor air) in buildings.
- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on potential future use as a drinking water source at the NBPLF and could be exposed to indoor air (if volatile chemicals are present in groundwater and migrate to indoor air) in buildings.

As discussed in Section 4.3.1, potential exposures and risks and hazards to site workers are estimated in the HHRA only if the estimated risks and hazards for a hypothetical residential scenario exceed acceptable risk levels and COCs are identified for a residential scenario. The human health CEM presenting potential exposure media, exposure points, receptors, and exposure routes is provided in Appendix A-5, Attachment 1 (Table 1), and depicted graphically on Figure 5.4-2.

5.4.6.2 Data Evaluation

Data Used in the HHRA

Historical groundwater samples collected from 1997, 2003, and 2004 and recent groundwater samples from 2018 to 2020 were used in the HHRA for the NBPLF. The groundwater samples collected in 1997, 2003, and 2004 were retained for metals analysis (only) since those samples were the most current metal analysis available. Samples from 2018 to 2020 were analyzed for explosives. One VOC (chloroform) was detected once in a 1995 sampling event at a concentration (0.71 µg/L) greater than the current tap water RSL (0.22 µg/L [USEPA, 2023a]), but no VOCs were detected in the 1997 sampling event, and there have been no historical detections of SVOCs, pesticides, PCBs, or PAHs at the NBPLF. Historical explosives data were not used in the HHRA since more current and representative data were collected from 2018 to 2020. Although some of the remaining data selected for the watershed-based ERA are older, this older data is still considered acceptable for use. As stated in the UFP-QAPP (CH2M, 2017), "Older data (i.e., data collected prior to 2012) may be used in the human health risk assessments if they are still representative of the site (i.e., groundwater flow is slow), chemicals have properties where there would not be a significant reduction in concentrations over time (e.g., metals), or data are conservative for site conditions." The NBPLF is generally not active, as described in Section 5.4.1. Potential soil sources to groundwater have been remediated, as described in Section 5.3.1.3. Due to a lack of continuing sources, historical concentrations in groundwater are expected to have remained stable or even decreased due to natural attenuation processes. Therefore, the assumptions in the final UFP-QAPP still hold. Samples collected prior to 2012 are considered representative of, or more conservative than, current conditions at the NBPLF.

A total of 14 groundwater samples were used to evaluate potential exposures for both a potable use scenario and the VI pathway. The groundwater samples were not collected at multilevel wells; therefore, a separate data grouping (based on shallow groundwater only) was not used to evaluate the VI pathway.

A summary of the number of chemicals analyzed and detected in groundwater is presented below:

Chemical Group	Number of Chemicals Analyzed	Number of Chemicals Detected
Groundwater		
Explosives	17	3
Metals	23	17

A description of the data groupings and samples included in the HHRA are provided in Tables 5.4-3 and 5.4-4, respectively. The analytical dataset used in the HHRA is included as Appendix A-5, Attachment 2. The groundwater sampling locations included in the HHRA are depicted on Figure 5.1-11.

Screening Results for Site-related Chemicals of Potential Concern and Naturally Occurring Chemicals

The approach and SLs used to select the COPCs (site-related COPCs or naturally occurring chemicals) are described in Section 4.3.1. The results of the COPC screening process for a hypothetical resident potentially exposed to groundwater are provided in Appendix A-5, Attachment 1 (Tables 2.1 and 2.2). The COPCs (site-related COPCs or naturally occurring chemicals) identified in site groundwater are summarized in the tables below.

Summary of COPCs for the NBPLF—Site-Related

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Groundwater Used for Tap Water				
Future Hypothetical Resident	RDX	4 / 7	0.27	14
	Antimony	1 / 1	4.1	4.1

Summary of COPCs for the NPBLF—Naturally Occurring Chemicals

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Groundwater Used for Tap Water				
Future Hypothetical Resident	Cadmium	3 / 5	0.56	0.93
	Chromium	5 / 5	1.0	5.23

5.4.6.3 Exposure Assessment

Although there is no burning/active landfill onsite, the NBPLF has one onsite building (BG-199-4), which is used as a breakroom by AO staff; in addition, dumpsters onsite are used for slightly contaminated explosives waste (as approved by USEPA), and there is an accumulation area for RCRA 90-day hazardous waste storage of paint filters, which are shipped offsite to an approved facility for destruction. The NBPLF is open to recreational activities, and hunting is permitted within the site boundary; however, there are no perennial surface water features within the NBPLF.

As previously discussed, groundwater is not currently being used as a potable water source; however, the HHRA for the NBPLF evaluated potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future site worker and residential exposures to groundwater. Therefore, ingestion, dermal contact, and inhalation exposures to COPCs in groundwater were estimated for future hypothetical residents (and site workers, if applicable); inhalation exposures of COPCs in indoor air from vapor intrusion of groundwater were not evaluated at the NBPLF since no vapor intrusion COPCs were identified (Appendix A-5, Attachment 1, Table 2.2). Culverts are not located at the NBPLF; therefore, potential ingestion, dermal contact, and inhalation exposures to shallow groundwater in a trench are incomplete for future construction/utility workers. As noted previously, risks and hazards for site workers are estimated only if the estimated risks or hazards for a hypothetical residential scenario exceed acceptable risk or hazard levels, and COCs are identified for a residential scenario. The potential exposure pathways quantified in the HHRA are indicated in Appendix A-5, Attachment 1 (Table 1), and on Figure 5.4-2. The following receptor scenario was quantified in the HHRA for the NBPLF:

- Future hypothetical residents (adult and child).
  - Groundwater (tap water) COPCs—ingestion and dermal contact.

Risks and hazards for site workers and construction/utility workers were not quantified in the HHRA because the estimated risks or hazards for a hypothetical residential scenario did not exceed acceptable risk or hazard levels and COCs were not identified for a residential scenario.

In accordance with USEPA guidance *Determining Groundwater Exposure Point Concentrations, Supplemental Guidance* (USEPA, 2014b), groundwater EPCs are typically calculated based on the data collected in the core of a plume. Two RDX plumes were historically present at the NBPLF (Figure 5.4-4); however, RDX was detected only at the eastern plume during the 2018–2020 RI activities. Two monitoring wells (NBPLF-MW3 and JAW-627) are located within the core of the plume; two groundwater samples are available in the HHRA data set for the RDX plume. If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the RDX plume, the maximum detected concentration of the COPC in the sitewide groundwater data set was used as the EPC.

For groundwater, where a sufficient number of samples and detected concentrations are available for COPCs, the UCL on the mean is selected as the EPC. For COPCs where fewer than eight samples or four detects were available, the maximum detected concentrations were selected as the EPCs. For antimony, cadmium, and chromium, the maximum detected concentrations were located outside of the RDX plume and were used as the EPCs. The groundwater EPCs used to estimate the chemical intakes for groundwater are provided in Appendix A-5, Attachment 1 (Table 3.1).

The exposure factors used in the intake calculations for receptor scenarios are included in Appendix A-5, Attachment 1 (Table 4.1). The primary references for the exposure factor values are the standard default exposure factors presented in the HHEM (USEPA, 2014a).

5.4.6.4 Toxicity Assessment

The oral toxicity values (CSFs and RfDs) used in the HHRA were obtained from the USEPA standard hierarchy of toxicity value sources (USEPA, 2003b), as provided in Section 4.3.1. Noncancer toxicity values for the COPCs identified at the NBPLF are provided in Appendix A-5, Attachment 1 (Table 5.1). Cancer toxicity values for the COPCs are provided in Appendix A-5, Attachment 1 (Table 6.1).

One COPC (chromium, evaluated as hexavalent chromium in the HHRA) was identified as acting with an MMOA. The ADAFs and exposure assumptions used to calculate adjusted intakes and exposure concentrations for chromium are provided in Appendix A-5, Attachment 1 (Table 4 Supplement).

5.4.6.5 Risk Characterization

The risk characterization for the NBPLF was completed using a four-step process, as discussed in Section 4.3.1. The results of each step are discussed below.

Step 1: Total Combined Risks and Hazards from Site-related COPCs and Naturally Occurring Chemicals

Step 1 consists of calculating receptor-specific ELCRs and HIs that include contributions from both site-related COPCs and naturally occurring chemicals. The estimated risks and hazards for a hypothetical residential scenario are summarized in Table 5.4-5.

Table 5.4-5. Summary of Total Combined Risk and Hazard Estimates for Site-Related COPCs and Naturally Occurring Chemicals—IAAP-037G: North Burn Pads Landfill Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-5, Attachment 1	Exposure Medium	COPC/Chemical	NBPLF		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.1 and 9.1	Groundwater (Tap Water)	RDX	14	NA	0.1
			Antimony	4.1	NA	0.3
			Cadmium	0.93	NA	0.3
			Chromium (hexavalent)	5.23	NA	0.08

Table 5.4-5. Summary of Total Combined Risk and Hazard Estimates for Site-Related COPCs and Naturally Occurring Chemicals—IAAP-037G: North Burn Pads Landfill Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-5, Attachment 1	Exposure Medium	COPC/Chemical	NBPLF EPC [b]	NBPLF ELCR	NBPLF HI
			Total HI (Groundwater—Tap Water):		**NA**	**0.8**
Hypothetical Resident (Child)	7.2 and 9.2	Groundwater (Tap Water)	RDX	14	NA	0.2
			Antimony	4.1	NA	0.5
			Cadmium	0.93	NA	0.5
			Chromium (hexavalent)	5.23	NA	0.1
			Total HI (Groundwater—Tap Water):		**NA**	**1**
Hypothetical Resident (Adult/Child Aggregate)	7.3 and 9.3	Groundwater (Tap Water)	RDX	14	1E-05	NA
			Antimony	4.1	NA	NA
			Cadmium	0.93	NA	NA
			Chromium (hexavalent)	5.23	1E-04	NA
			Total ELCR (Groundwater—Tap Water):		**2E-04**	**NA**

Notes:

µg/L = microgram per liter

COPC = chemical of potential concern

ELCR = excess lifetime cancer risk

EPC = exposure point concentration

HI = hazard index

NA = not applicable

RME = reasonable maximum exposure

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water) - µg/L

Step 2: Risk Characterization of Naturally Occurring Chemicals

Step 2 consists of calculating receptor-specific ELCRs and HIs for naturally occurring chemicals. Two COPCs (cadmium and chromium) were identified as naturally occurring or not site-related chemicals in site groundwater at the NBPLF, as discussed in Section 5.4.4.2. The maximum detected concentrations of cadmium and chromium were less than their respective BTVs. The estimated risks and hazards for the naturally occurring chemicals in groundwater for a future hypothetical residential scenario are provided in Table 5.4-6. The naturally occurring chemicals are not used to identify the final COCs for the NBPLF and are not discussed further in the HHRA after this step.

Table 5.4-6. Summary of Risk and Hazard Estimates for Naturally Occurring Chemicals— IAAP-037G: North Burn Pads Landfill Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-5, Attachment 1	Exposure Medium	COPC/Chemical	NBPLF		
				EPC [b]	ELCR	HI
Hypothetical Resident (Adult)	7.4 and 9.4	Groundwater (Tap Water)	Cadmium	0.93	NA	0.3
			Chromium (hexavalent)	5.23	NA	0.08
			Total HI (Groundwater—Tap Water):		**NA**	**0.4**
Hypothetical Resident (Child)	7.5 and 9.5	Groundwater (Tap Water)	Cadmium	0.93	NA	0.5
			Chromium (hexavalent)	5.23	NA	0.1
			Total HI (Groundwater—Tap Water):		**NA**	**0.6**
Hypothetical Resident (Adult/Child Aggregate)	7.6 and 9.6	Groundwater (Tap Water)	Cadmium	0.93	NA	NA
			Chromium (hexavalent)	5.23	1E-04	NA
			Total ELCR (Groundwater—Tap Water):		**1E-04**	NA

Notes:

COPC = chemical of potential concern

ELCR = excess lifetime cancer risk

EPC = exposure point concentration

HI = hazard index

NA = not applicable

RME = reasonable maximum exposure

μg/L = microgram per liter

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water) - μg/L

Step 3: Risk Characterization of Site-related COPCs

Step 3 consists of calculating receptor-specific ELCRs and HIs associated with site-related COPCs. One metal (antimony) and one explosive (RDX) were identified as site-related COPCs for groundwater at the NBPLF. The estimated risks and hazards for RDX in groundwater for a hypothetical resident are provided in Table 5.4-7.

Table 5.4-7. Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-037G: North Burn Pads Landfill Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-5, Attachment 1	Exposure Medium	COPC/Chemical	NBPLF		
				EPC [b]	ELCR	HI
	7.7 and 9.7	Groundwater	RDX	14	NA	0.1

Table 5.4-7. Summary of Risk and Hazard Estimates for Site-Related COPCs— IAAP-037G: North Burn Pads Landfill Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-5, Attachment 1	Exposure Medium	COPC/Chemical	NBPLF		
				EPC [b]	**ELCR**	**HI**
Hypothetical Resident (Adult)		(Tap Water)	Antimony	4.1	NA	0.3
			Total HI (Groundwater—Tap Water):		**NA**	**0.4**
Hypothetical Resident (Child)	7.8 and 9.8	Groundwater (Tap Water)	RDX	14	NA	0.2
			Antimony	4.1	NA	0.5
			Total HI (Groundwater—Tap Water):		**NA**	**0.7**
Hypothetical Resident (Adult/Child Aggregate)	7.9 and 9.9	Groundwater (Tap Water)	RDX	14	1E-05	NA
			Antimony	4.1	NA	NA
			Total ELCR (Groundwater—Tap Water):		**1E-05**	**NA**

Notes:

COPC = chemical of potential concern

ELCR = excess lifetime cancer risk

EPC = exposure point concentration

HI = hazard index

NA = not applicable

RME = reasonable maximum exposure

μg/L = microgram per liter

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water) - μg/L

Step 4: Final COC Determination

The total ELCRs and HIs estimated for groundwater based on a future hypothetical residential scenario (adult and child) did not exceed USEPA's acceptable risk range of 1×10^{-6} to 1×10^{-4} and target organ HI of 1. Therefore, no COCs were identified for groundwater at the NBPLF, and the NBPLF qualifies for an NFA decision for groundwater based on the results of the HHRA.

5.4.6.6 Uncertainty Analysis

The assumptions used in the HHRAs have inherent uncertainty. The general uncertainties associated with the HHRAs for the sites in this RI report are provided in Section 4.3.1. This section provides additional site-specific uncertainties associated with the HHRA for the NBPLF that are not included in Section 4.3.1.

Total chromium was initially identified as a COPC in groundwater because the maximum detected concentration for total chromium exceeded the tap water RSL for hexavalent chromium. It is likely that some or all of the total chromium concentrations are in the trivalent chromium form. All of the groundwater chromium concentrations are less than the tap water RSL for trivalent chromium and the MCL and BTV for total chromium. Using the hexavalent chromium RSL to evaluate total chromium in the COPC selection process was a conservative approach in the HHRA. Total chromium was determined to be naturally occurring in groundwater at the NBPLF.

The maximum RL of detected chemicals not identified as COPCs in the RAGS Table 2 Series (Appendix A-2, Attachment 1) was compared to their RSL. However, chemicals whose RL exceeds the RSL were not identified as COPC. For the NBPLF, silver's RL exceeded its RSL. Although the RLs for this detected chemical is greater than the RSL, further consideration of this detected chemical does not appear warranted in the NBPLF HHRA.

Chemicals that were 100 percent not detected in groundwater were not included in the COPC identification process; however, they were evaluated in a separate screening to determine if elevated nondetected results were present in groundwater. The detailed analysis of the nondetected chemicals at the NBPLF is provided in Appendix A-5, Attachment 3. In summary, four nondetected explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene, and nitrobenzene), and three nondetected metals (arsenic, cobalt, and thallium) have DLs and/or RLs exceeding SLs at the NBPLF. Although the DLs and/or RLs for these nondetect chemicals are greater than the SLs, based on the acceptably low DLs, further consideration of nondetect chemicals does not appear warranted in the NBPLF HHRA.

5.4.6.7 Summary of HHRA

An HHRA was prepared for the NBPLF to evaluate potential current and future health risks from exposure to chemicals in site groundwater. Although there is no burning/active landfill onsite, the NBPLF is an active site, and a building (BG-199-4) is present. The only current activity at NBPLF is use of BG-199-4 as a breakroom for AO staff, the use of dumpsters for slightly contaminated explosives waste (as approved by USEPA), and as an accumulation area for RCRA 90-day hazardous waste storage of paint filters, which are shipped offsite to an approved facility for destruction. The NBPLF is open to recreational activities and hunting is permitted within the site boundary; however, there are no perennial surface water features within the NBPLF. Soil is addressed under the remedy for OU-1 (IAAP-012) (Leidos, 2018).

The following potential human receptors were identified in the HHRA for the NBPLF:

- **Current Site Workers.** There are no complete exposure pathways for current site workers since volatile chemicals were not detected in NBPLF groundwater.
- **Future Site Workers.** Future site workers could contact groundwater based on potential future use as a drinking water source at the NBPLF.
- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on potential future use as a drinking water source at the NBPLF.

Potential exposures and risks and hazards to future site workers were not estimated in the HHRA since estimated risks and hazards for a hypothetical residential scenario did not exceed acceptable risk and hazard levels and no COCs were identified for a residential scenario.

The COPCs (site-related COPCs or naturally occurring chemicals) identified in site groundwater are as follows:

- Groundwater (potable use):
  - Naturally occurring: cadmium and chromium.
  - Site-related: antimony and RDX.

The risk characterization for the NBPLF was completed using a four-step process, as discussed in Section 4.3.1. Step 1 presents the total combined risks and hazards from site-related COPCs and naturally occurring chemicals, as summarized in Table 5.4-5. Step 2 presents the risks and hazards from naturally occurring chemicals, as summarized in Table 5.4-6. Step 3 presents the risks and hazards from site-related COPCs, as summarized in Table 5.4-7.

No unacceptable groundwater risks or hazards were identified in Step 3 for hypothetical residents. Therefore, in Step 4, no COCs were identified for groundwater at the NBPLF, and the NBPLF site qualifies for an NFA decision for groundwater based on the results of the HHRA.

5.4.7 Ecological Risk Assessment

The ERA for groundwater at the NBPLF is presented herein, beginning with Step 1 of the ERA process (to determine whether there are complete exposure pathways). Soil at the NBPLF is already addressed under the remedy for OU-1. There are no perennial surface water features within the NBPLF boundary; however, Spring Creek is present to the east of the NBPLF. A summary of the ERA conclusions for Spring Creek and its perennial tributaries is provided in the ERA for the WBPA (Section 5.2.7).

Groundwater is present onsite, but ecological receptors are not exposed directly to groundwater; nevertheless, groundwater is a transport medium, and contaminated groundwater has the potential to migrate to and discharge to surface water bodies. There is a lack of perennial surface water bodies on the NBPLF. Therefore, the groundwater-to-surface-water exposure pathway is incomplete. There are no complete exposure pathways for ecological receptors on the site. Therefore, there are no adverse effects identified and no additional actions are required from an ecological perspective.

5.4.8 Conclusions and Recommendations

An RI was conducted for the NBPLF to refine the nature and extent of contamination in groundwater from historical activities and assess for potentially unacceptable risk to human health and adverse effects to the environment. Analytical data available for groundwater at NBPLF includes data for explosives, VOCs, SVOCs, PAHs, radionuclides, and metals. Of these, explosives and metals were identified as site-related chemicals of interest based on historical site operations and a comparison of concentration data to site characterization PALs and BTVs (See Section 4.1).

In groundwater, no VOCs or metals were detected above their site characterization PAL or BTV (if available) during the most recent sampling events, aside from antimony, which exceeded the BTV at monitoring well JAW-626 in 2004 but was below the PAL. Only one explosive (RDX) was detected above its site characterization PAL during the 2018–2020 RI sampling events. RDX contamination has been observed as two small plumes at the NBPLF. The largest plume is located along the eastern boundary of the site within the overburden aquifer. The second RDX plume is isolated and was historically defined by former overburden well JAW-625. However, RDX was not detected in nearby NBPLF-MW1 during the current RI (2018–2020). Therefore, RDX concentrations in this second plume may have attenuated below the site characterization PAL. The soil removal that was completed in 1998 is assumed to have removed the bulk of RDX contamination that could be a source to groundwater. Confirmation sampling showed one RDX concentration (2.5 mg/kg) above the OU-1 leachability-based RG (1.3 mg/kg) within the former NBPLF. The increasing RDX concentrations at JAW-627 indicate there may still be a source of RDX leaching to groundwater from the former landfill. Increasing RDX concentrations may also be indicative of continued plume migration.

An HHRA and an ERA were conducted to quantify potential risks and hazards to human health and the environment from exposure to contaminants at the NBPLF. The following conclusions were made based on the risk assessments:

- The HHRA concluded that there are no unacceptable risks or hazards for hypothetical residents from exposure to groundwater at the NBPLF.
- The ERA concluded that there are no adverse effects to ecological receptors identified and no additional actions are required from an ecological perspective.

Based on the results of the RI and risk assessments, NFA appears to be warranted for groundwater at the EBPs. However, given the increasing RDX concentrations in groundwater at JAW-627, and the fact that not all RDX in soil was removed at this site to the OU-1 leachability RG, additional groundwater monitoring is recommended at JAW-627 as part of a Supplemental Remedial Investigation (SRI). The additional groundwater data from an SRI can be used as a further line of evidence that NFA is warranted for the NBPLF.

5.5 Fire Training Pit—Groundwater (IAAP-039G)

This subsection summarizes RI activities at the FTP site within the EDA and documents the RI for groundwater at the FTP (IAAP-039G). Soil is addressed under the remedy for OU-1 (IAAP-039) (Leidos, 2018). There are no perennial surface water features within the FTP site boundary; however, Spring Creek flows adjacent to several environmental sites within the EDA (Figure 5.1-1). Because the largest portion of Spring Creek and perennial tributaries are present within the WBPA site boundary, risk assessment of surface water and sediment will be evaluated under that IAAAP site (IAAP-032G) and presented in Section 5.2.

The FTP was identified as an area of potential interest (AOPI) during a Preliminary Assessment for per- and polyfluoroalkyl substances (PFAS) at IAAAP (Arcadis, 2020). As documented in the final *Fourth Five-Year Review Report for IAAAP* (USACE and Dawson, 2021), historical activities at the FTP were performed during the period of known use of aqueous film-forming foam by the military for firefighting training. The U.S. Army is evaluating IRP sites for perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), and perfluorooctanesulfonic acid (PFOS) contamination and is following Department of Defense and Army guidance and policy regarding these emerging chemicals. The PFAS AOPIs are currently under a site inspection. The evaluation of PFOS, PFBS, and PFOA at the FTP has not been completed and, therefore, PFAS is not a component of this OU-10 RI.

5.5.1 Background

5.5.1.1 Site Description

The FTP is an inactive site in the northeast portion of the IAAAP facility (Figure 5.1-1). The FTP site boundary encompasses approximately 2 acres. The FTP is part of a larger area, the EDA.

The FTP area includes a former smoke trainers vault (Building 200-30), two former burn pits southeast of the smoke trainers vault, and a former disposal pit between the smoke trainers vault and the burn pits.

5.5.1.2 Operational History

The FTP was built in the early 1970s and consisted of an unlined, open depression that measured approximately 40 feet wide, 16 feet long, and 2 feet deep (Tetra Tech, 2006, 2012). A crescent-shaped berm approximately 3 feet high was present around the northern and western boundaries of the pit (JAYCOR, 1996). This pit was used for firefighting training operations between 1982 and 1987. Fire-extinguishing training procedures included setting 55-gallon drums filled with solvents and fuels on fire and then subsequently extinguishing them. Installation personnel do not have records explicitly stating aqueous film-forming foam was used for this training; however, a previous document referenced foams that were used to extinguish these fires (URS, 2004c). Waste solvents were reportedly used from 1982 to 1984, and fuels were reportedly used from 1984 to 1987. Water from the fire-extinguishing exercises, in addition to old paint, was also disposed of at the FTP. Based on summaries of previously conducted interviews (Tetra Tech, 2006), wastes burned at the FTP were typically generated at one of the load lines and were not stored in the FTP area. Fire training activities at the FTP were discontinued in 1988.

Two smaller pits existed north of the main training pit, discussed above. One disposal pit, northwest of the FTP, contained trash and debris, and another burn pit, northeast of the FTP, was used to burn wastes similar to those used in the firefighting practices in the main pit, though this northeast disposal pit was not used for firefighter training. At this pit, trucks reportedly would unload liquid wastes, approximately two or three 55-gallon drums' worth at a time, directly to the pit onto hay bales that were then ignited and allowed to burn. This northeast pit was reportedly used during the same period as the main training pit.

The former smoke trainers vault (Building 200-30) was used from 1982 to 1987 during firefighting sessions (JAYCOR, 1996). According to IAAAP personnel, only scrap wood and wooden pallets were burned here (URS, 2004c).

Operational activities were also conducted in buildings or igloos outside the FTP site boundary. Building BG-2,southeast of the FTP site boundary, was used as a laboratory in the 1940s and 1950s and was then converted to an explosives-holding building in the 1990s. Storage igloos BG-3, BG-4, BG-5, and BG- 12 were reportedly used to store explosives, which were moved from the igloos to the Explosive Waste Incinerator (EWI) for incineration (URS, 2004c). Storage igloos BG-3 through BG-5 have recently been demolished.

5.5.1.3 Previous Investigations and Remedial Actions

Numerous investigations have been conducted at IAAAP since the 1980s. Table 5.5-1 summarizes the previous investigations and remedial actions conducted at the FTP, including conclusions and recommendations. Although soil at FTP has already been addressed under OU-1, previous investigations for soil are also presented in Table 5.5-1 to support the CSM.

This report summarizes the RI for groundwater at the FTP (IAAP-039G). Previous investigations pertinent to the RI for groundwater are listed below; additional details on these investigations (including a more detailed description of work completed, as well as work not pertinent to this RI), are included in Table 5.5-1. Previous groundwater sampling locations are shown on Figure 5.1-2.

Investigation	Conclusion
Facility-wide Preliminary Assessment (JAYCOR, 1994)	The Preliminary Assessment indicated that while no evidence had been found at the FTP, no specific contamination study had been performed in this area. Because the Preliminary Assessment indicated there was a potential for contamination at the EDA, it was recommended that the extent of contamination in the vicinity of the EDA should be confirmed, and surface water and groundwater contaminant migration should be investigated.
Facility-wide Site Inspection (JAYCOR, 1992)	No groundwater samples were collected at the FTP during the SI. Further investigation was recommended as part of the RI.
Phase I and Follow-on Remedial Investigation (JAYCOR, 1993, 1996)	Six newly installed piezometers (R27-PZ-01 through R27-PZ-06) were sampled for metals, VOCs, and SVOCs during Phase I. Eight new monitoring wells were installed and sampled for VOCs, SVOCs, and metals during Phase II and follow-on RI activities. In groundwater, VOCs and SVOCs were the main contaminants observed at the FTP, and metals contamination was present to a lesser extent. The RI recommended semiannual compliance groundwater monitoring at three wells in the FTP for VOCs, SVOC, and metals.
Periodic Groundwater and Surface Water Monitoring (multiple reports)	Periodic groundwater sampling was conducted at the FTP between the 1994 and 2004 as part of the FFA compliance monitoring and groundwater monitoring program. Samples were analyzed for VOCs, SVOC, explosives, metals, radionuclides, and/or natural attenuation parameters. Numerous VOCs associated with chlorinated solvents, breakdown products of solvents, and fuels in excess of screening levels were detected in groundwater. Two compounds, 1,1-DCA and 1,1-DCE, exceeded with the greatest frequency and over the largest extent. The highest concentrations of VOCs were noted to be generally in the area of the former excavation, screened across sand that was intentionally placed at the bottom of the excavation. Some wells exhibited exceedances of metals, particularly manganese and iron. RDX was consistently detected above screening criteria at one well, FTA-99-1.

Investigation	Conclusion
Supplemental Groundwater Remedial Investigation (MWH, 2001)	In 1997, groundwater samples were collected from eight existing monitoring wells and analyzed for VOCs, SVOCs, explosives, and metals. VOCs, primarily 1,1-DCE and PCE, exceeded screening levels at six locations and two locations contained SVOCs above screening levels. No metals or explosives contamination was detected at the FTP. It was concluded that VOC contamination was present in both shallow and bedrock, however no deeper wells were present in the area to provide vertical delineation. Additional horizontal delineation was also warranted to the southeast of the FTP.
Additional Monitoring Well Installation (Harza, 2000)	Three new wells were installed. One 6-inch sump well (SA-99-1) was installed within the former pit area and two monitoring wells (shallow overburden and bedrock wells) were installed downgradient of the excavation area. The wells were added to the groundwater monitoring program.
Feasibility Study Data Collection (URS, 2004c)	Groundwater samples were collected from 26 DPT borings and analyzed for VOCs and/or explosives. Groundwater samples were also collected from eight new monitoring wells and analyzed for explosives, metals, VOCs, and natural attenuation parameters. VOCs were detected in DPT and monitoring well groundwater samples. Explosives were detected in one DPT sample and two well samples. Arsenic was also detected above screening criteria at the SA-99-1 well. Risk assessments were conducted using the groundwater data collected during the Feasibility Study investigation and the groundwater and surface water data collected during the periodic, compliance, monitoring events. VOCs, explosives, and arsenic were identified as a groundwater COCs while there were no COCs identified for surface water for the commercial/industrial worker. Groundwater flow and contaminant fate and transport models were developed. The models predicted that VOC concentrations in groundwater should continue to decline over time due to naturally occurring processes. The initial natural attenuation concluded that natural attenuation processes may be occurring in the FTP plume, particularly within the source area.
Groundwater Treatability Study (Tetra Tech, 2010)	A groundwater treatability study was conducted at the FTP to test the efficacy of in situ bioremediation at reducing the high chlorinated VOC contamination. High-fructose corn syrup solutions were injected into five DPT injection points between 2005 and 2006. Six monitoring wells were monitored during the study. It was concluded that high-fructose corn syrup fostered fermentation; however, concentrations of PCE, TCE, and 1,1,1-TCA increased in the study area. Approximately 30 feet from the FTP, PCE concentrations remained stable. TCE, 1,1,1-TCA, and 1,1-DCE concentrations began to decrease after an initial increase, but in some instances, 2010 results were higher than baseline concentrations.
Comprehensive Watersheds Evaluation and Supplemental Data Collection Work Plan (Tetra Tech, 2006)	The work plan concluded that no groundwater, surface water, or sediment data gaps were present at the FTP.

PCE = tetrachloroethylene

As part of the previous investigations under OU-1, explosives, VOCs, SVOCs, pesticides, PCBs, and metals were identified as soil COCs for the EDA (ECC, 2000). Elevated levels of VOCs, SVOCs, metals, and polynuclear aromatic compounds were identified in soil at the FTP. To address risks and hazards associated with these COCs, soil removal actions have been conducted at the FTP and LUCs have been implemented (Leidos, 2019); excavation areas are shown on Figure 5.1-1. Between 1998 and 2003, approximately 6,166 cubic yards of contaminated soil was removed from excavations around the FTP.

In 1998, approximately 4,250 cubic yards of contaminated soil was removed (ECC, 2000). The soil excavation was completed in three phases up to depth of 22 feet bgs. Final confirmation samples verified that all soil COCs were removed to excavation criteria within the unsaturated zone. Final confirmation soil samples from this first removal action were below the excavation criteria. Prior to backfilling the excavation, approximately 2 to 3 feet of sand was placed along the bottom of the entire excavation for groundwater extraction (ECC, 2000), if necessary. The remainder of the excavation was backfilled with clay (ECC, 2000).

In 2003, an additional 616 cubic yards of soil contaminated with explosives and metals was removed to approximately 10 feet bgs from the former burn pit north of the main training pit. Approximately 116 cubic yards of explosives and metals contaminated soils and debris were removed to approximately 6 feet bgs from the former disposal pit between the main training pit and smoke trainers vault. Based on confirmation sampling, no soil with concentrations above OU-1 RGs remained in these excavated areas (ECC, 2005). The excavations were deemed clean for backfilling (ECC, 2005).

5.5.2 2018–2020 Remedial Investigation Activities

Additional field work was conducted at the FTP to resolve data gaps needed to complete the RI for groundwater (IAAP-039G). As documented in the final *Site-specific Worksheets for Operable Unit 6 of the Uniform Federal Policy–Quality Assurance Project Plan for Remedial Investigation at Iowa Army Ammunition Plant (Packet 2*) (CH2M, 2018a), although groundwater contamination at the FTP had been delineated, concentrations of site contamination may have changed because of source removal actions, natural degradation, and treatability study injections. Therefore, additional monitoring was warranted to understand of current conditions to complete the RI. To address this data gap, groundwater sampling was conducted at 24 existing wells at the FTP and four existing wells at the WBPA. Fieldwork at the FTP was conducted in accordance with the UFP-QAPP (CH2M 2018a).

Between March 8 and 24, 2019, groundwater samples were collected from 24 existing monitoring wells at the FTP and three existing wells at the WBPA (WBP-99-1, JAW-25, and G-30). An additional well from the WBPA (JAW-68) was sampled in December 2019. Groundwater samples were collected from all wells for analysis of VOCs by Method SW8260. Eleven of the monitoring wells at the FTP were also sampled for explosives by Method SW8330B, and 12 monitoring wells at the FTP were also sampled for metals by Method SW6020A. The four WBPA monitoring wells (WBP-99-1, JAW-25, JAW-68, and G-30) were also sampled for explosives and are discussed in Section 5.2. Monitoring wells were sampled via low-flow purging and sampling techniques. Purge logs are included in Appendix C. Data was managed and validated as discussed in Section 3.3. Laboratory reports are provided in Appendix B.

All IDW generated during activities (purge water) was disposed of in accordance with management activities discussed in Section 3.2.9. Waste management documentation is provided in Appendix D.

Six existing monitoring wells (FTA-TT-MW-01 through FTA-TT-MW-05, and FTP-UNKMW-001) were resurveyed by Bruner, Cooper, and Zuck, Inc., licensed Iowa surveyors, on December 17, 2019, since top-of-casing elevation data were not available for these wells. Survey information is included in Appendix E.

5.5.3 Environmental Setting

5.5.3.1 Topography and Surface Water

The terrain of this site gently slopes to the south and southeast. The eastern portions of the site slope toward an intermittent tributary of Spring Creek, located southeast of the FTP. Ground surface elevations range from 692 feet above mean sea level at the northern end of the FTP area to 656 feet above mean sea level at the tributary of Spring Creek. Surface runoff is channeled through ditches and culverts along the roads at the site, which direct water south and east toward an intermittent tributary of Spring Creek (Figure 5.1-1).

5.5.3.2 Geology and Hydrogeology

The geology of the FTP area consists of unconsolidated overburden overlying shale and limestone bedrock. Overburden thickness ranges from roughly 10 to 30 feet. At the FTP, it consists primary of glacial till, observed as a heterogeneous mixture of clay, silt, sand, and gravel. Discontinuous sand and gravel seams are present in some areas to a depth of 12 to 15 feet bgs (JAYCOR, 1996; Tetra Tech, 2006). Stiff clay is present in the northern portion of the site overlying the bedrock, near the former Smoke Training Vault and main training pit and is considered an aquitard based on very a low vertical hydraulic conductivity of 1.5×10^{-9} cm/sec based on laboratory Shelby tube analysis (JAYCOR, 1996). In the southern portion of the site, the stiff clay transitions to a clay containing silt and increasing amounts of sand. Bedrock in this area is described from area boring logs as coarse grained, fossiliferous limestone of the Warsaw Formation. The upper portion of the bedrock near the overburden and bedrock interface is weathered and contains fractures (JAYCOR, 1996).

Overburden groundwater at the FTP is monitored by wells with screen intervals ranging from 5 to 34 feet bgs. Groundwater was measured between 3.73 and 13.63 feet btoc during the recent 2019 gauging event; however, historically water levels have ranged between approximately 2 and 22 feet btoc. Water levels from overburden wells screened partly in a sandy layer are typically higher than levels in surrounding areas. Bedrock groundwater was measured between 10.15 and 20.25 feet btoc in 2019; however, historically bedrock groundwater has been measured up to 47.9 feet btoc.

Based on historical and recent groundwater gauging data, overburden groundwater flows semiradially towards Spring Creek (to the northeast and east) and an intermittent tributary to Spring Creek (to the southeast) (Figure 5.1-3). A groundwater high is typically present near JAW-63 and/or JAW-62; both wells are in the western portion of the FTP area. Hydraulic gradients are low, between 0.001 and 0.06 ft/ft. Bedrock groundwater flow is to the east (Figure 2-3), with historical hydraulic gradients between approximately 0.01 and 0.04 ft/ft. Downward vertical gradients were observed at well pairs FTP-MW7/FTP-MW8, JAW-60/FTP-MW4, and FTA-99-1/FTA-99-2 based on March 2019 groundwater elevation data (Table 5.1-3). Hydraulic conductivities based on slug tests range from 0.0017 to 1.7 feet per day in overburden and between 0.00042 to 0.0076 feet per day in bedrock (Tetra Tech, 2012). The higher hydraulic conductivity values in the overburden are attributed to wells partly screened within sand lenses or weathered bedrock.

5.5.4 Nature and Extent of Contamination

This subsection describes the nature and extent of groundwater contamination at the FTP area. There are no perennial surface water features present at this site. Although soil has been addressed under OU-1, a summary of the soil COCs is discussed briefly to inform the CSM for potential groundwater contaminants. The source of contamination at the FTP area is attributed to releases to the surface and subsurface as a result of historical site operations, including chemical use, burning, and debris disposal.

Groundwater samples have been collected at the FTP since 1992. Twenty-four active monitoring wells are present at the FTP. Fourteen of the wells are screened in the overburden to depths ranging from 5 to 32 feet bgs, five wells are screened across the overburden/bedrock transition zone from 5.5 to 34 feet bgs, and five are screened in shallow bedrock at depths ranging from 10.5 to 59.1 feet bgs (locations presented in Figure 5.1-2). Historical groundwater samples were analyzed for analyzed for VOCs, SVOCs, PAHs, explosives, metals, PCBs, radionuclides, and pesticides. No PCBs were detected in historical groundwater samples, and pesticides have not been detected since 1992. Based on historical site operations and COCs identified in soil, explosives, VOCs, and metals are considered chemicals of interest in groundwater at the FTP.

Samples were collected from 24 monitoring wells during the most recent RI activities, between 2018 and 2020, and analyzed for VOCs, metals, and/or explosives. Table 5.5-2 summarizes the chemicals detected in groundwater between 2000 and 2020 sampling events at the FTP. Summary tables of all the analytical results (including nondetects) from the 2018–2020 RI activities are provided in Appendix G. Summary tables of all historical analytical results from the FTP are provided in Appendix H.

VOCs

Forty-five VOCs have been detected in groundwater at the FTP since 2000 (Table 5.5-2). However, only thirteen VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2,4-trimethylbenzene, 1,2-dichloroethane, benzene, cis-1,2-DCE, methylene chloride, PCE, TCE, toluene, vinyl chloride, and o-xylene) exceeded their site characterization PALs during the most recent (2019) monitoring event. VOC exceedances were observed at nine monitoring wells at the FTP with the highest concentrations and greatest number of VOCs being observed in wells located at the former main training pit and the 1998 soil removal area. VOC contamination is observed as one large plume, which extends from this source area to the east and south, extending outside of the FTP site boundary (Figure 5.1-5). This plume configuration is consistent with the groundwater flow gradients (Figure 5.1-3).

- Eleven VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2,4-trimethylbenzene, 1,2-dichloroethane, benzene, cis-1,2-DCE, PCE, toluene, vinyl chloride, and o-xylene) were detected at FTA-TT-MW-03, near the former berm surrounding the main training pit. These 11 VOCs were also detected at their highest concentrations at this location in 2019 (Figure 5.1-5). The VOC with the highest concentration was 1,1-DCA, at 4,900 µg/L. VOC concentrations at FTA-TTMW-03 declined from concentrations detected in 2010 for all analytes analyzed for in 2019, except for 1,1-DCE, PCE, and vinyl chloride, whose concentrations increased.
- TCE exceeded its PAL (5 µg/L) at three locations (JAW-60, JAW-61, and FTA-TT-MW-02) in 2019. Concentrations of TCE exceeding the PAL ranged between 37 J µg/L and 82 µg/L in the southwest portion of the FTP.
- Methylene chloride exceeded its PAL (5 µg/L) at three locations (FTA-TT-MW-02, FTA-TT-MW-04, and SA-99-1), all within the soil removal area, the former main training pit.
- Only three VOCs (1,1-DCA, 1,1-DCE, and PCE) were detected above their PALs at monitoring wells farthest downgradient of the FTP area (JAW-80, JAW-59, and FTP-MW5).

VOC exceedances at the FTP were observed in overburden and transition monitoring wells between 5 and 35 feet bgs. No VOCs were detected above their site characterization PALs at shallow bedrock monitoring wells at the FTP. VOC concentrations were nondetect or detected below PALs at JAW-62, JAW-63, FTP-MW7/FTP-MW8, M-01, FTP-MW1, FTA-99-1/FTA-99-2, FTP-MW2, FTP-MW3, and G-30 northwest, southwest, south, and east of the VOC plume (Figure 5.1-5). Based on the 2019 data in these monitoring wells and historical DPT groundwater samples, the VOC plume at the FTP is delineated.

Explosives

Between 2000 and 2019, thirteen explosives were detected at the FTP (Table 5.5-2). During the most recent RI monitoring event (2019), only RDX and 4-amino-2,6-DNT exceeded their site characterization PALs and at only one location (sump well SA-99-1), as shown on Figure 5.1-4. RDX was detected at a concentration of 5.1 J µg/L at this location. RDX concentrations have been increasing at monitoring well SA-99-1 since 2002, when concentrations were nondetect. During previous sampling events, in 2000 through 2004, RDX also exceeded its PAL at FTA-99-1; however, in 2019, the RDX concentration at this location had decreased to 0.36 J µg/L.

Metals

Twelve metals have been detected in groundwater at the FTP since 2000; however, only arsenic was detected above its site characterization PAL (10 µg/L) and BTV (33.3 µg/L) during the most recent monitoring event, in 2019. Arsenic exceeded its PAL and BTV at two locations (FTA-TT-MW-02 and SA-

99-1), with the maximum arsenic concentration (56 µg/L) detected at SA-99-1, the sump well in the former training pit footprint.

Iron exceeded its PAL (14,000 µg/L) and BTV (9,736 µg/L) at five locations, and manganese exceeded its PALs (430 µg/L) and BTV (580 µg/L) at seven locations in 2010; iron and manganese were not analyzed during the 2019 RI event. However, these elevated concentrations of iron and manganese are not considered site-related and are attributed to the enhanced reducing conditions created by the treatability study (Tetra Tech, 2010). As described in Table 5.5-1, high-fructose corn syrup was injected in the subsurface to assess the potential for enhanced bioremediation of chlorinated VOCs in groundwater in 2005–2006. Analysis of iron and manganese were included in the 2005 though 2010 performance monitoring events for monitoring wells located within the treatability study boundary to help evaluate whether reducing conditions were being established. The iron and manganese exceedances were observed during these performance monitoring events.

Concentrations of some metals may be naturally elevated in the environment, and may not indicate a CERCLA-regulated release. Several metals (such as cadmium, chromium, lead, mercury, and selenium) were detected below their BTVs and PALs during the latest sampling events and are therefore considered to be naturally occurring in groundwater at the FTP.

5.5.5 Fate and Transport

This section discusses the fate and transport of site-related chemicals of interest at the FTP. This includes chemicals that were detected above both their site characterization PAL and BTV (if available) during the last sampling event that those chemicals were analyzed for. In groundwater, potential site-related chemicals of interest are VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2,4-trimethylbenzene, 1,2-dichloroethane, benzene, cis-1,2-DCE, methylene chloride, PCE, toluene, vinyl chloride, and o-xylene), explosives (RDX and 4-amino-2,6-DNT), and metals (arsenic). Fate and transport characteristics for these chemicals are described in Section 3.2.

The FTP area, which is part of the larger EDA, was formerly used for firefighting training operations, debris disposal, and open burning. The EDA is fenced. The FTP area is vegetated and with no remaining structures onsite. This site falls within the Spring Creek watershed (Figure 2-1); however, there are no perennial surface water features within the site boundary (Figure 5.1-1). Surface water drainage occurs through a number of intermittent drainage ditches, which ultimately discharge to Spring Creek. The groundwater at the FTP area is divided into two units, overburden and bedrock groundwater. Groundwater levels measured in the overburden aquifer ranged from approximately 4 to 14 feet btoc (Figure 5.1-3), although historically groundwater has ranged from approximately 2 to 22 feet bgs. Bedrock groundwater levels ranged from approximately 10 to 20 feet btoc in 2019.

The source of contamination at the FTP area is attributed to releases to the surface as a result of historical site operations, including chemical use, burning, and disposal. Contaminants in groundwater have been transported from the source release areas through advection and dispersion. Groundwater generally flows semiradially towards Spring Creek (to the northeast and east) and an intermittent tributary to Spring Creek (to the southeast) (Figure 5.1-3). As expected, estimated hydraulic conductivity values are slow and ranged from 0.0017 to 1.7 ft/day in overburden and between 0.00042 to 0.0076 ft/day in bedrock (Tetra Tech, 2012). Downward vertical gradients were observed in 2019. Vertical migration at the site is likely limited by the generally tight clay lithology in the overburden.

As discussed in Table 5.5-1, a groundwater treatability study was conducted in 2005–2006 at the FTP, where historically the highest VOC concentrations had been observed. DPT injection of a high-fructose corn syrup solution was completed around SA-99-1, which was installed within the footprint of the 1998 soil removal area. Following the treatability study, concentrations of PCE, TCE, and 1,1,1-TCA increased in the study area. TCE, 1,1,1-TCA, and 1,1-DCE concentrations began to decrease after an initial increase, but in some instances, results were higher than initial concentrations. PCE and TCE concentrations at SA-99-1 declined to nondetect in 2019.

Natural attenuation mechanisms that are potentially active at the FTP were evaluated. Natural attenuation includes various physical, chemical, or biological processes that under favorable conditions act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. A weight-of-evidence approach was used for this evaluation.

- The primary line of evidence that attenuation is occurring at a site is reduction over time in contaminant concentrations or mass, or both.
  - Two explosives (RDX and 4-amino-2,6-DNT) were detected above their site characterization PALs in one overburden sump well in 2019. RDX concentrations in this well (SA-99-1) have increased since the early 2000s; however, concentrations remain relatively low (< 10 µg/L) (Table 5.5-2). RDX was not detected in adjacent monitoring well FTA-TT-MW-05 and was detected at low levels at upgradient monitoring well JAW-63. Therefore, the extent of explosives contamination is limited.
  - Numerous VOCs associated with chlorinated solvents, fuels, and associated breakdown products have been detected at the FTP. Historically, 1,1-DCE and 1,1-DCA have exceeded their PALs with the greatest frequency. VOCs were detected above their site characterization PALs in nine overburden and transition monitoring wells during the 2019 sampling event. The maximum VOC concentration detected in 2019 was 1,1-DCA at 4,900 µg/L at FTA-TT-MW-03. Historically, the maximum concentration of 1,1-DCA was 7,500 µg/L at SA-99-1 in the 2000, although concentrations have declined at this location to 200 µg/L in 2019. This decrease in concentrations is likely a combination of the soil removal, treatability study injections, and natural attenuation. However, an increasing trend at FTA-TT-MW-03, located near the former berm to the training pit, may be indicative of a continuing source or some plume migration. Nevertheless, the lack of VOCs exceedances in the most downgradient wells (JAW-62, JAW-63, FTP-MW7/FTP-MW8, M-01, FTP-MW1, FTA-99-1/FTA-99-2, FTP-MW2, FTP-MW3, and G-30) indicate that any plume migration is limited.
  - Arsenic was also identified as a chemical of interest in groundwater. As previously discussed, total arsenic exceeded its PAL (10 µg/L) and BTV (33.3 µg/L) at only two locations in 2019 (FTA-TT-MW-02 and SA-99-1), with the maximum arsenic concentration (56 µg/L) detected at SA-99-1). Both of these wells are located in the vicinity of the former training pit and 1998 soil removal area. Arsenic concentrations in SA-99-1 have been fairly consistent since 2001.
- Reductive degradation products of TCE and PCE were detected at the FTP in 2019. Cis-1,2-DCE was detected in ten monitoring wells between <1 µg/L and 2,000 µg/L and vinyl chloride was detected in five wells between 1.3 J µg/L and 510 µg/L. Additionally, the presence of 1,1-DCE and 1,1-DCA may be due to degradation of 1,1,1-TCA (Table 5.5-2). During the 2005–2006 treatability study, groundwater samples were analyzed for ethane and ethene. Both of these dissolved gasses were detected at low levels (up to 740 µg/L), indicating that the injections likely enhanced biodegradation of the chlorinated VOCs during this time period, and full reductive dechlorination was occurring.
- No RDX degradation products (MNX, DNX, or TNX) were detected at the FTP area wells during the latest sampling event in 2019.
- Water quality parameters can be used to evaluate whether the geochemical conditions are conducive to biodegradation. During the current RI, groundwater was observed to be under anaerobic and reducing conditions in the former training pit area, near monitoring wells SA-99-1, and FTA-TT-MW-01 through FTA-TT-MW-05. DO concentrations were reported in groundwater between 0.14 and 0.55 mg/L and ORP values ranged from -5.9 to -111.7 mV in these wells. Groundwater was observed to be under aerobic and oxidizing conditions at all other monitoring

wells at the FTP area. Outside of the former main training pit area, DO concentrations in groundwater were reported between 0.59 and 6.7 mg/L, and ORP values were reported above generally +100 mV (Tables 5.1-5). pH values were relatively neutral (between 6 and 7), which is favorable for biological activity, except for one monitoring well, FTA-TT-MW-02, where the pH was 5.44.

- Under these geochemical conditions, anaerobic biodegradation of VOCs and RDX would be more favorable within the main source area (former training pit) and less favorable at the rest of the site. However, the bulk of VOC and explosives contaminant mass are present within the former training pit area. Therefore, conditions are most favorable for anerobic biodegradation in the area with the highest mass and concentrations. In regard to arsenic, concentrations will increase under reducing conditions due to reductive dissolution of iron and manganese, which the arsenic tends to sorb to.
- In areas of the site where conditions are more aerobic and oxidizing, VOC (i.e., 1,1-DCE) degradation may be less favorable. However, 1,1-DCA and TCE can degrade via aerobic cometabolism, which may explain the lack of reductive daughter products in the downgradient portion of the plume. In addition, TCE and RDX can degrade by biologic and abiotic pathways. While arsenic can be present in a form that is more mobile under oxidizing conditions, it tends to sorb or complex with clays, organic material, iron hydroxides, or manganese oxides, limiting its mobility (ERG, 2005). This may explain the lack of arsenic exceedances outside of the source area.

The physical natural attenuation processes are also likely helping to stabilize the plumes, particularly the explosives and arsenic exceedances, which have a limited extent. While the explosives in groundwater have moderate solubility and relatively low sorption potential, they should be retarded somewhat as it sorbs to the clay geology and may explain their limited extent at the FTP area. VOCs are characterized by relatively high solubilities and low sorption potential (Table 4.2-1). VOCs also have a high vapor pressure and may volatilize into soil gas at the interface with the water table.

5.5.6 Human Health Risk Assessment

An HHRA was prepared for the FTP to evaluate potential current and future health risks and hazards from exposure to chemicals in site groundwater. Soil media within the FTP is not included in the HHRA as it is not a component of this RI; the soil RI was conducted under OU-1. A brief summary of OU-1 soil COCs is provided in Section 5.5.1.3 and historical remedial activities for soil are presented in Table 5.5-1. Surface water and sediment media are not included in the HHRA because perennial surface water features are not present at the FTP. The HHRA was conducted in accordance with the final UFP-QAPP (CH2M, 2017a), with the exception of some deviations that were agreed to during meetings or correspondence with USACE and USEPA following approval of the final UFP-QAPP. The approach and methods used to conduct the HHRA are provided in Section 4.3.1. This section presents the CEM for the FTP and provides the results of the four-step evaluation process comprising the following:

- Data evaluation.
- Exposure assessment.
- Toxicity assessment.
- Risk characterization.

The results of the HHRA are used to determine whether further action is warranted for groundwater at the FTP.

5.5.6.1 Conceptual Exposure Model

A description of the FTP, its operational history, previous investigations, and remedial actions are provided in Sections 5.5.1 and 5.5.2. The site, which is no longer active, was formerly used for fire training operations, debris disposal, and open burning. The FTP is primarily grass-covered with a few roads remaining, which lead to the cleared/paved areas associated with demolished building footprints. There are no buildings within the FTP site boundary. There are no potential receptors or potentially complete exposure pathways identified under current site conditions. Although the site is open to recreational activities and hunting is permitted within the site boundary, there are no perennial surface water features within the FTP site boundary. It is assumed that the site could become active or redeveloped in the future. Although not present within the FTP site boundary, culverts are present within the extent of the VOC plume; therefore, potential groundwater exposures by future construction/utility workers are considered complete at the FTP.

Groundwater is not currently being used as a potable water source, and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the FTP is classified as Class IIB, a potential source of drinking water (USEPA, 1989). Therefore, the HHRA for the FTP evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future residential exposures to groundwater.

The following potential future human receptors were identified in the HHRA for the FTP:

- **Future Site Workers.** Future site workers could contact groundwater based on its potential future use as a drinking water source at the FTP. If buildings are constructed onsite, future site workers could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in future buildings.
- **Future Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert.
- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on its potential future use as a drinking water source at the FTP and could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in future residences.

As discussed in Section 4.3.1, potential exposures and risks and hazards to future site workers and construction/utility workers are estimated in the HHRA only if the estimated risks or hazards for a hypothetical residential scenario exceed acceptable risk levels, and COCs are identified for a hypothetical residential scenario. The human health CEM presenting potential exposure media, exposure points, receptors (future), and exposure routes is provided in Appendix A-6, Attachment 1 (Table 1), and depicted graphically on Figure 5.5-1.

5.5.6.2 Data Evaluation

Data Used in the HHRA

The analytical data used in the HHRA consisted of groundwater samples collected at the FTP in March 2019. Groundwater samples were analyzed for explosives, metals, PAHs, SVOCs, and VOCs. It should be noted that the evaluation of PFOS, PFBS, and PFOA at the FTP has not been completed, and therefore PFAS is not a component of this OU-10 RI. Twenty-six groundwater samples were used to evaluate potential exposures for both a potable use scenario and the VI pathway. The groundwater samples were not collected at multilevel wells; therefore, a separate data grouping (based on shallow groundwater only) was not used to evaluate the VI pathway. A separate groundwater data grouping was used to evaluate a construction/utility worker scenario, assuming construction/utility workers could be exposed to groundwater encountered at depths up to 10 feet bgs. Fifteen groundwater samples were used to evaluate potential exposures in a trench for a construction/utility worker.

A summary of the number of chemicals analyzed and detected in groundwater is presented below:

Chemical Group	Number of Chemicals Analyzed	Number of Chemicals Detected
Groundwater		
Explosives	17	4
Metals	8	3
PAHs	1	1
SVOCs	5	1
VOCs	61	30

A description of the data groupings and samples included in the HHRA are provided in Tables 5.5-3 and 5.5-4, respectively. The analytical dataset used in the HHRA is included as Appendix A-6, Attachment 2.

Screening Results for Site-related Chemicals of Potential Concern and Naturally Occurring Chemicals

The approach and SLs used to select the COPCs (site-related COPCs or naturally occurring chemicals) are described in Section 4.3.1. The results of the COPC screening process are provided in Appendix A-6, Attachment 1 (Tables 2.1 through 2.3). As summarized below, three explosives, two metals, one PAH, and 22 VOCs were identified as COPCs (site-related COPCs or naturally occurring chemicals) in groundwater for a potable use scenario. Thirteen VOCs were identified as COPCs in groundwater for vapor intrusion. Three explosives, two metals, one PAH, and 22 VOCs were identified as COPCs in groundwater for a construction/utility worker scenario. The COPCs (site-related COPCs or naturally occurring chemicals) are addressed further in the HHRA, and potential exposures and risks and hazards were estimated for each COPC (site-related COPC). No naturally occurring chemicals were identified as COPCs.

Summary of COPCs for the FTP—Site-Related*

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Groundwater Used for Tap Water				
Future Site Worker and Future Hypothetical Resident	2-Amino-4,6-dinitrotoluene	1 / 10	1.2	1.2
	4-Amino-2,6-dinitrotoluene	1 / 10	4.4	4.4
	RDX	4 / 10	0.36	5.1
	Arsenic	4 / 13	17	56
	Barium	13 / 13	42	2000
	Naphthalene	2 / 24	3.7	10
	1,1,1-Trichloroethane	11 / 24	0.24	2000
	1,1,2-Trichloroethane	4 / 24	0.4	2.5
	1,1-Dichloroethane	14 / 24	0.58	4900
	1,1-Dichloroethene	10 / 24	1.4	270
	1,2,4-Trimethylbenzene	5 / 24	0.33	110
	1,2-Dichloroethane	7 / 24	0.82	81

Summary of COPCs for the FTP—Site-Related*

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
	1,3,5-Trimethylbenzene	4 / 24	4.7	34
	Acetone	2 / 24	200	6700
	Benzene	7 / 24	0.87	88
	Chloroethane	6 / 24	2.5	1100
	Chloroform	1 / 24	0.35	0.35
	cis-1,2-Dichloroethene	11 / 24	0.45	2000
	Ethylbenzene	6 / 24	0.31	130
	Methyl ethyl ketone	2 / 24	44	5100
	Methyl isobutyl ketone	2 / 24	110	1700
	Methylene chloride	3 / 24	7.6	160
	Tetrachloroethene	7 / 24	0.38	59
	Toluene	5 / 24	0.18	3500
	Trichloroethene	7 / 24	0.22	82
	Vinyl chloride	5 / 24	0.24	510
	Xylene, m,p-	5 / 24	0.19	570
	Xylene, o-	4 / 24	14	210
Groundwater to Indoor Air via Vapor Intrusion				
Future Site Worker and Future Hypothetical Resident	1,1,1-Trichloroethane	11 / 24	0.24	2000
	1,1,2-Trichloroethane	4 / 24	0.4	2.5
	1,1-Dichloroethane	14 / 24	0.58	4900
	1,1-Dichloroethene	10 / 24	1.4	270
	1,2,4-Trimethylbenzene	5 / 24	0.33	110
	1,2-Dichloroethane	7 / 24	0.82	81
	Benzene	7 / 24	0.87	88
	cis-1,2-dichloroethene	7 / 14	1	2000
	Ethylbenzene	6 / 24	0.31	130
	Tetrachloroethene	7 / 24	0.38	59
	Trichloroethene	7 / 24	0.22	82
	Vinyl chloride	5 / 24	0.24	510
	Xylene, m,p-	5 / 24	0.19	570
	Xylene, o-	4 / 24	14	210

Summary of COPCs for the FTP—Site-Related*

Receptor	COPC	Frequency of Detections	Minimum Detection (µg/L)	Maximum Detection (µg/L)
Shallow Groundwater in a Trench (<10 ft bgs)				
Future Construction / Utility Worker	2-Amino-4,6-dinitrotoluene	1 / 5	1.2	1.2
	4-Amino-2,6-dinitrotoluene	1 / 5	4.4	4.4
	RDX	2 / 5	0.46	5.1
	Arsenic	4 / 10	17	56
	Barium	10 / 10	93	2000
	Naphthalene	2 / 14	3.7	10
	1,1,1-Trichloroethane	6 / 14	0.24	2000
	1,1,2-Trichloroethane	1 / 14	0.64	0.64
	1,1-Dichloroethane	9 / 14	0.58	4900
	1,1-Dichloroethene	5 / 14	1.4	270
	1,2,4-Trimethylbenzene	5 / 14	0.33	110
	1,2-Dichloroethane	5 / 14	1.6	81
	1,3,5-Trimethylbenzene	4 / 14	4.7	34
	Acetone	2 / 14	200	6700
	Benzene	6 / 14	0.98	88
	Chloroethane	5 / 14	2.5	1100
	Chloroform	1 / 14	0.35	0.35
	cis-1,2-Dichloroethene	7 / 14	1	2000
	Ethylbenzene	6 / 14	0.31	130
	Methyl ethyl ketone	2 / 14	44	5100
	Methyl isobutyl ketone	2 / 14	110	1700
	Methylene chloride	3 / 14	7.6	160
	Tetrachloroethene	4 / 14	0.38	59
	Toluene	5 / 14	0.18	3500
	Trichloroethene	3 / 14	2.8	82
	Vinyl chloride	4 / 14	0.24	510
	Xylene, m,p-	5 / 14	0.19	570
	Xylene, o-	4 / 14	14	210

* No COPCs at FTP are naturally occurring.

5.5.6.3 Exposure Assessment

The FTP is currently inactive, and former buildings have been demolished. The site is open to recreational activities, and hunting is permitted within the site boundary; however, there are no perennial surface water bodies within the FTP site boundary. Therefore, there are no potentially complete exposure pathways identified under current site conditions.

As previously discussed, groundwater is not currently being used as a potable water source; however, the HHRA for the FTP evaluated potential exposures to groundwater due to its potential future use as a drinking water source. This consists of the evaluation of future residential exposures to groundwater. Therefore, ingestion and dermal contact exposures to COPCs in groundwater were estimated for future site workers and hypothetical residents.

Additionally, inhalation exposures to site groundwater were evaluated for hypothetical residents assuming VOCs could be present in household air as a result of showering, bathing, and other household activities. The vapor intrusion pathway is also considered potentially complete for groundwater if future industrial buildings or residences are constructed at the FTP; therefore, potential inhalation exposures to indoor air were evaluated for site workers and hypothetical residents.

Culverts are located within the VOC plume associated with the FTP; therefore, potential ingestion, dermal contact, and inhalation exposures to shallow groundwater in a trench were evaluated for future construction/utility workers. The potential exposure pathways quantified in the HHRA are included in Appendix A-6, Attachment 1 (Table 1), and on Figure 5.5-1. The following receptor scenarios were quantified in the HHRA for the FTP:

- Future Site Worker
  - Groundwater (tap water) COPCs—ingestion and dermal contact
  - Groundwater (vapor intrusion) COPCs—inhalation of volatiles in indoor air
- Future Construction/Utility Worker
  - Shallow groundwater (trench, 0 to 10 feet bgs) COPCs—incidental ingestion, dermal contact and inhalation of volatiles
- Future hypothetical residents (adult and child)
  - Groundwater (tap water) COPCs—ingestion, dermal contact, and inhalation of volatiles in household air
  - Groundwater (vapor intrusion) COPCs—inhalation of volatiles in indoor air

Risks and hazards for site workers and construction/utility workers were quantified in the HHRA because the estimated risks or hazards for a hypothetical residential scenario exceeded acceptable risk or hazard levels and COCs were identified for a residential scenario.

In accordance with USEPA guidance *Determining Groundwater Exposure Point Concentrations, Supplemental Guidance* (USEPA, 2014b), groundwater EPCs are typically calculated based on the data collected in the core of a plume. One RDX and one VOC plume are present at the FTP (Figures 5.1-4 and 5.1-5, respectively). Four groundwater samples are available in the HHRA dataset for the RDX plume, and 14 groundwater samples are available for the VOC plume. Four shallow groundwater samples are available for the RDX plume, and nine shallow groundwater samples are available for the VOC plume.

Fourteen monitoring wells are located within the core of the VOC plume: FTA-TT-MW-01, FTA-TT-MW-02, FTA-TT-MW-03, FTA-TT-MW-04, FTA-TT-MW-05, FTP-MW4, FTP-MW5, FTP-MW6, JAW-58, JAW-59, JAW-60, JAW-61, JAW-80, and SA-99-1. Five monitoring wells are located within the core of the RDX plume: FTA-TT-MW-01, FTA-TT-MW-02, FTA-TT-MW-03, FTA-TT-MW-04, and SA-99-1. For a potable use scenario and trench/culvert scenario, the monitoring wells within the RDX plume were used to estimate the EPCs for the COPCs that were explosives, and the monitoring wells within the VOC plume were used to estimate the EPCs for the COPCs that were identified as VOCs. For the VI pathway, the sitewide dataset was used to estimate the EPCs.

For COPCs with at least four detected concentrations and eight samples available in the VOC and RDX groundwater plume datasets, UCLs were calculated using USEPA's ProUCL software (USEPA, 2016), and the UCLs were selected as the EPCs. Thirteen COPCs had fewer than four detected concentrations and/or fewer than eight samples; therefore, a reliable UCL could not be estimated, and the maximum detected concentrations from the plumes were selected as the EPCs for these COPCs. For the VI pathway, the maximum detected concentration of each COPC was used as the EPC. The groundwater EPCs used to estimate the chemical intakes for each receptor scenario are provided in Appendix A-6, Attachment 1 (Tables 3.1 through 3.3). The ProUCL output for the COPCs is provided in Appendix A-6, Attachment 3.

The exposure factors used in the intake calculations for future receptor scenarios are included in Appendix A-6, Attachment 1 (Tables 4.1 through 4.5). The primary references for the exposure factor values are the standard default exposure factors presented in the HHEM (USEPA, 2014a).

Three COPCs (methylene chloride, TCE, and vinyl chloride) were identified as acting with an MMOA in site groundwater. The ADAFs and exposure assumptions used to calculate adjusted intakes and exposure concentrations for these COPCs are provided in Appendix A-6, Attachment 1 (Table 4 Supplement).

5.5.6.4 Toxicity Assessment

The oral toxicity values (CSFs and RfDs) and inhalation toxicity values (IURs and RfCs) used in the HHRA were obtained from the USEPA standard hierarchy of toxicity value sources (USEPA, 2003b), as provided in Section 4.3.1. Noncancer toxicity values for the COPCs identified at the FTP are provided in Appendix A-6, Attachment 1 (Tables 5.1 and 5.2). Cancer toxicity values for the COPCs are provided in Appendix A-6, Attachment 1 (Tables 6.1 and 6.2).

5.5.6.5 Risk Characterization

The risk characterization for the FTP was completed using a four-step process, as discussed in Section 4.3.1. The results of each step are discussed below.

Step 1: Total Combined Risks and Hazards from Site-related COPCs and Naturally Occurring Chemicals

Step 1 consists of calculating receptor-specific ELCRs and HIs that include contributions from both site-related COPCs and naturally occurring chemicals. No naturally occurring chemicals were identified as COPCs. The estimated risks and hazards for a hypothetical residential scenario are summarized below in Table 5.5-5 in Step 3.

Step 2: Risk Characterization of Naturally Occurring Chemicals

Step 2 consists of calculation of receptor-specific ELCRs and HIs for naturally occurring chemicals (if any). However, no naturally occurring chemicals were identified in site groundwater at the FTP, and therefore this step was not performed.

Step 3: Risk Characterization of Site-related COPCs

Step 3 consists of calculating receptor-specific ELCRs and HIs associated with site-related COPCs. All COPCs evaluated in Step 1 were identified as site-related COPCs for groundwater at the FTP. The estimated risks and hazards for COPCs in groundwater for a future site worker, construction/utility worker, and hypothetical resident are provided in Table 5.5-5.

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit		
				EPC [b]	ELCR	HI
Site Worker	7.4 and 9.4	Groundwater (Tap water)	2-Amino-4,6-dinitrotoluene	1.2E+00	NA	0.1
			4-Amino-2,6-dinitrotoluene	4.4E+00	NA	0.4
			RDX	5.1E+00	1E-06	0.01
			Arsenic	5.6E+01	3E-04	2
			Barium	2.0E+03	NA	0.09
			1,1,1-Trichloroethane	1.6E+03	NA	0.007
			1,1,2-Trichloroethane	1.2E+00	2E-07	0.003
			1,1-Dichloroethane	4.9E+03	9E-05	0.2
			1,1-Dichloroethene	1.0E+02	NA	0.02
			1,2,4-Trimethylbenzene	3.3E+01	NA	0.03
			1,2-Dichloroethane	2.3E+01	6E-06	0.03
			1,3,5-Trimethylbenzene	1.0E+01	NA	0.01
			Acetone	6.7E+03	NA	0.06
			Benzene	3.5E+01	6E-06	0.08
			Chloroethane	3.2E+02	NA	NA
			Chloroform	3.5E-01	3E-08	0.0003
			cis-1,2-Dichloroethene	1.8E+03	NA	8
			Ethylbenzene	3.9E+01	1E-06	0.004
			Methyl ethyl ketone	5.1E+03	NA	0.07
			Methyl isobutyl ketone	1.7E+03	NA	NA
			Methylene chloride	1.6E+02	1E-06	0.2
			Naphthalene	1.0E+01	4E-06	0.005
			Tetrachloroethene	5.7E+01	4E-07	0.09
			Toluene	1.0E+03	NA	0.1
			Trichloroethene	2.7E+01	4E-06	0.5
			Vinyl chloride	5.1E+02	2E-03	1
			Xylene, m,p-	1.6E+02	NA	0.008
			Xylene, o-	5.8E+01	NA	0.003

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit		
				EPC [b]	ELCR	HI
			Total ELCR and HI (Groundwater—Tap Water): [c]		**3E-03**	**13**
		Groundwater (Indoor Air)	1,1,1-Trichloroethane	8.4E+02	NA	0.04
			1,1,2-Trichloroethane	4.5E-02	6E-08	0.05
			1,1-Dichloroethane	6.9E+02	9E-05	NA
			1,1-Dichloroethene	1.9E+02	NA	0.2
			1,2,4-Trimethylbenzene	1.3E+01	NA	0.05
			1,2-Dichloroethane	2.2E+00	5E-06	0.07
			Benzene	1.2E+01	7E-06	0.09
			cis-1,2-Dichloroethene	2.0E+02	NA	1
			Ethylbenzene	2.1E+01	4E-06	0.005
			Tetrachloroethene	2.3E+01	5E-07	0.1
			Trichloroethene	1.9E+01	6E-06	2
			Vinyl chloride	4.3E+02	3E-04	1
			Xylene, m,p-	8.5E+01	NA	0.2
			Xylene, o-	2.2E+01	NA	0.05
			Total ELCR and HI (Groundwater—Indoor Air): [c]		**4E-04**	**5**
	Total ELCR and HI (Groundwater—Indoor Air and Tap Water): [c]				**3E-03**	**18**
Construction/ Utility Worker	7.5 and 9.5	Shallow Groundwater (Trench)	2-Amino-4,6-dinitrotoluene	1.2E+00	NA	0.002
			4-Amino-2,6-dinitrotoluene	4.4E+00	NA	0.008
			RDX	5.1E+00	3E-11	0.000009
			Arsenic	5.6E+01	6E-09	0.03
			Barium	2.0E+03	NA	0.01
			Naphthalene	1.0E+01	4E-09	0.0001
			1,1,1-Trichloroethane	2.0E+03	NA	0.0005
			1,1,2-Trichloroethane	6.4E-01	1E-11	0.0001
			1,1-Dichloroethane	4.9E+03	1E-08	0.002
			1,1-Dichloroethene	1.1E+02	NA	0.02

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit		
				EPC [b]	ELCR	HI
			1,2,4-Trimethylbenzene	6.3E+01	NA	0.02
			1,2-Dichloroethane	3.3E+01	8E-10	0.0009
			1,3,5-Trimethylbenzene	1.6E+01	NA	0.003
			Acetone	6.7E+03	NA	0.002
			Benzene	8.2+01	3E-09	0.01
			Chloroethane	6.9E+02	NA	0.04
			Chloroform	3.5E-01	5E-12	0.000003
			cis-1,2-Dichloroethene	2.0E+03	NA	0.1
			Ethylbenzene	6.6E+01	2E-09	0.008
			Methyl ethyl ketone	5.1E+03	NA	0.0005
			Methyl isobutyl ketone	1.7E+03	NA	0.001
			Methylene chloride	1.6E+02	7E-11	0.001
			Tetrachloroethene	2.3E+01	1E-10	0.02
			Toluene	1.9E+03	NA	0.008
			Trichloroethene	8.2E+01	3E-09	0.3
			Vinyl chloride	1.8E+02	1E-07	0.05
			Xylene, m,p-	2.7E+02	NA	0.004
			Xylene, o-	8.9E+01	NA	0.001
			Total ELCR and HI (Shallow Groundwater—Trench):		**1E-07**	**0.6**
		Trench Air	Naphthalene	6.5E+01	3E-08	0.6
			1,1,1-Trichloroethane	1.4E+04	NA	0.08
			1,1,2-Trichloroethane	4.3E+00	9E-10	0.01
			1,1-Dichloroethane	4.0E+04	9E-07	NA
			1,1-Dichloroethene	8.9E+02	NA	0.1
			1,2,4-Trimethylbenzene	4.7E+02	NA	0.07
			1,2-Dichloroethane	2.6E+02	9E-08	0.1
			1,3,5-Trimethylbenzene	1.2E+02	NA	0.02
			Acetone	2.6E+04	NA	NA
			Benzene	7.6E+02	8E-08	0.3

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit		
				EPC [b]	ELCR	HI
			Chloroethane	7.0E+03	NA	0.05
			Chloroform	2.6E+00	8E-10	0.3
			cis-1,2-Dichloroethene	1.7E+04	NA	NA
			Ethylbenzene	5.2E+02	4E-07	0.001
			Methyl ethyl ketone	2.4E+04	NA	16
			Methyl isobutyl ketone	9.8E+03	NA	8
			Methylene chloride	1.4+03	5E-09	0.9
			Tetrachloroethene	1.5E+02	1E-08	3
			Toluene	1.6E+04	NA	2
			Trichloroethene	5.9E+02	8E-07	201
			Vinyl chloride	1.8E+03	5E-06	16
			Xylene, m,p-	2.1E+03	NA	4
			Xylene, o-	7.0E+02	NA	1
			Total ELCR and HI (Shallow Groundwater—Trench Air): [c]		**8E-06**	**255**
			Total ELCR and HI (Shallow Groundwater—Groundwater and Trench Air): [c]		**8E-06**	**255**
Hypothetical Resident (Adult)	7.6 and 9.6	Groundwater (Tap water)	2-Amino-4,6-dinitrotoluene	1.2E+00	NA	0.4
			4-Amino-2,6-dinitrotoluene	4.4E+00	NA	1
			RDX	5.1E+00	NA	0.04
			Arsenic	5.6E+01	NA	6
			Barium	2.0E+03	NA	0.3
			1,1,1-Trichloroethane	1.6E+03	NA	0.03
			1,1,2-Trichloroethane	1.2E+00	NA	0.009
			1,1-Dichloroethane	4.9E+03	NA	0.8
			1,1-Dichloroethene	1.0E+02	NA	0.07
			1,2,4-Trimethylbenzene	3.3E+01	NA	0.2
			1,2-Dichloroethane	2.3E+01	NA	0.1

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit		
				EPC [b]	ELCR	HI
			1,3,5-Trimethylbenzene	1.0E+01	NA	0.05
			Acetone	6.7E+03	NA	0.2
			Benzene	3.5E+01	NA	0.3
			Chloroethane	3.2E+02	NA	NA
			Chloroform	3.5E-01	NA	0.001
			cis-1,2-Dichloroethene	1.8E+03	NA	31
			Ethylbenzene	3.9E+01	NA	0.02
			Methyl ethyl ketone	5.1E+03	NA	0.3
			Methyl isobutyl ketone	1.7E+03	NA	NA
			Methylene chloride	1.6E+02	NA	0.8
			Naphthalene	1.0E+01	NA	0.2
			Tetrachloroethene	5.7E+01	NA	0.4
			Toluene	1.0E+03	NA	0.5
			Trichloroethene	2.7E+01	NA	2
			Vinyl chloride	5.1E+02	NA	5
			Xylene, m,p-	1.6E+02	NA	0.04
			Xylene, o-	5.8E+01	NA	0.01
			Total HI (Groundwater—Tap Water): [c]		**NA**	**50**
		Groundwater (Indoor Air—Vapor Intrusion)	1,1,1-Trichloroethane	8.4E+02	NA	0.2
			1,1,2-Trichloroethane	4.5E-02	NA	0.2
			1,1-Dichloroethane	6.9E+02	NA	NA
			1,1-Dichloroethene	1.9E+02	NA	0.9
			1,2,4-Trimethylbenzene	1.3E+01	NA	0.2
			1,2-Dichloroethane	2.2E+00	NA	0.3
			Benzene	1.2E+01	NA	0.4
			cis-1,2-Dichloroethene	2.0E+02	NA	5
			Ethylbenzene	2.1E+01	NA	0.02
			Tetrachloroethene	2.3E+01	NA	0.5
			Trichloroethene	1.9E+01	NA	9

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit EPC [b]	ELCR	HI
			Vinyl chloride	4.3E+02	NA	4
			Xylene, m,p-	8.5E+01	NA	0.8
			Xylene, o-	2.2E+01	NA	0.2
			Total HI (Groundwater—Indoor Air): [c]		**NA**	**22**
		Total HI (Groundwater—Tap Water and Indoor Air): [c]			**NA**	**112**
Hypothetical Resident (Child)	7.7 and 9.7	Groundwater (Tap water)	2-Amino-4,6-dinitrotoluene	1.2E+00	NA	0.6
			4-Amino-2,6-dinitrotoluene	4.4E+00	NA	2
			RDX	5.1E+00	NA	0.06
			Arsenic	5.6E+01	NA	9
			Barium	2.0E+03	NA	0.5
			1,1,1-Trichloroethane	1.6E+03	NA	0.05
			1,1,2-Trichloroethane	1.2E+00	NA	0.02
			1,1-Dichloroethane	4.9E+03	NA	1.3
			1,1-Dichloroethene	1.0E+02	NA	0.1
			1,2,4-Trimethylbenzene	3.3E+01	NA	0.3
			1,2-Dichloroethane	2.3E+01	NA	0.2
			1,3,5-Trimethylbenzene	1.0E+01	NA	0.09
			Acetone	6.7E+03	NA	0.4
			Benzene	3.5E+01	NA	0.5
			Chloroethane	3.2E+02	NA	NA
			Chloroform	3.5E-01	NA	0.002
			cis-1,2-Dichloroethene	1.8E+03	NA	51
			Ethylbenzene	3.9E+01	NA	0.03
			Methyl ethyl ketone	5.1E+03	NA	0.4
			Methyl isobutyl ketone	1.7E+03	NA	NA
			Methylene chloride	1.6E+02	NA	1
			Naphthalene	1.0E+01	NA	0.04
			Tetrachloroethene	5.7E+01	NA	0.7

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit EPC [b]	ELCR	HI
			Toluene	1.0E+03	NA	0.8
			Trichloroethene	2.7E+01	NA	3
			Vinyl chloride	5.1E+02	NA	9
			Xylene, m,p-	1.6E+02	NA	0.06
			Xylene, o-	5.8E+01	NA	0.02
			Total HI (Groundwater—Tap Water): [c]		**NA**	**82**
		Groundwater (Indoor Air—Vapor Intrusion)	1,1,1-Trichloroethane	8.4E+02	NA	0.2
			1,1,2-Trichloroethane	4.5E-02	NA	0.2
			1,1-Dichloroethane	6.9E+02	NA	NA
			1,1-Dichloroethene	1.9E+02	NA	0.9
			1,2,4-Trimethylbenzene	1.3E+01	NA	0.2
			1,2-Dichloroethane	2.2E+00	NA	0.3
			Benzene	1.2E+01	NA	0.4
			cis-1,2-Dichloroethene	2.0E+02	NA	5
			Ethylbenzene	2.1E+01	NA	0.02
			Tetrachloroethene	2.3E+01	NA	0.5
			Trichloroethene	1.9E+01	NA	9
			Vinyl chloride	4.3E+02	NA	4
			Xylene, m,p-	8.5E+01	NA	0.8
			Xylene, o-	2.2E+01	NA	0.2
			Total HI (Groundwater—Indoor Air):		**NA**	**22**
		Total HI (Groundwater—Tap Water and Indoor Air): [c]			**NA**	**144**
Hypothetical Resident (Adult/Child Aggregate)	7.8 and 9.8	Groundwater (Tap water)	2-Amino-4,6-dinitrotoluene	1.2E+00	NA	NA
			4-Amino-2,6-dinitrotoluene	4.4E+00	NA	NA
			RDX	5.1E+00	5E-06	NA
			Arsenic	5.6E+01	1E-03	NA
			Barium	2.0E+03	NA	NA
			1,1,1-Trichloroethane	1.6E+03	NA	NA

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater

Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit		
				EPC [b]	**ELCR**	**HI**
			1,1,2-Trichloroethane	1.2E+00	4E-06	NA
			1,1-Dichloroethane	4.9E+03	1E-03	NA
			1,1-Dichloroethene	1.0E+02	NA	NA
			1,2,4-Trimethylbenzene	3.3E+01	NA	NA
			1,2-Dichloroethane	2.3E+01	1E-04	NA
			1,3,5-Trimethylbenzene	1.0E+01	NA	NA
			Acetone	6.7E+03	NA	NA
			Benzene	3.5E+01	8E-05	NA
			Chloroethane	3.2E+02	NA	NA
			Chloroform	3.5E-01	2E-06	NA
			cis-1,2-Dichloroethene	1.8E+03	NA	NA
			Ethylbenzene	3.9E+01	3E-05	NA
			Methyl ethyl ketone	5.1E+03	NA	NA
			Methyl isobutyl ketone	1.7E+03	NA	NA
			Methylene chloride	1.6E+02	1E-05	NA
			Naphthalene	1.0E+01	9E-05	NA
			Tetrachloroethene	5.7E+01	5E-06	NA
			Toluene	1.0E+03	NA	NA
			Trichloroethene	2.7E+01	2E-04	NA
			Vinyl chloride	5.1E+02	7E-03	NA
			Xylene, m,p-	1.6E+02	NA	NA
			Xylene, o-	5.8E+01	NA	NA
			Total ELCR (Groundwater—Tap Water): [c]		**9E-03**	**NA**
		Groundwater (Indoor Air—Vapor Intrusion)	1,1,1-Trichloroethane	8.4E+02	NA	NA
			1,1,2-Trichloroethane	4.5E-02	3E-07	NA
			1,1-Dichloroethane	6.9E+02	4E-04	NA
			1,1-Dichloroethene	1.9E+02	NA	NA
			1,2,4-Trimethylbenzene	1.3E+01	NA	NA
			1,2-Dichloroethane	2.2E+00	2E-05	NA

Table 5.5-5. Summary of Risk and Hazard Estimates for Site-Related COPCs—IAAP-039G: Fire Training Pit Groundwater
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor [a]	ELCR/HI Tables (RME) in Appendix A-6, Attachment 1	Exposure Medium	COPC	Fire Training Pit		
				EPC [b]	ELCR	HI
			Benzene	1.2E+01	3E-05	NA
			cis-1,2-Dichloroethene	2.0E+02	NA	NA
			Ethylbenzene	2.1E+01	2E-05	NA
			Tetrachloroethene	2.3E+01	2E-06	NA
			Trichloroethene	1.9E+01	4E-05	NA
			Vinyl chloride	4.3E+02	5E-04	NA
			Xylene, m,p-	8.5E+01	NA	NA
			Xylene, o-	2.2E+01	NA	NA
			Total ELCR (Groundwater—Indoor Air): [c]		**1E-03**	**NA**
		Total ELCR (Groundwater—Tap Water and Indoor Air): [c]			**1E-02**	**NA**

Notes:

µg/L = microgram per liter
EPC = exposure point concentration
µg/m³ = microgram per cubic meter
HI = hazard index
COPC = chemical of potential concern
NA = not applicable
ELCR = excess lifetime cancer risk
RME = reasonable maximum exposure

[a] ELCRs were estimated for the adult/child aggregate receptor based on lifetime exposure and noncarcinogenic HIs were estimated separately for adult and child residents.

[b] EPC Units: groundwater (tap water) and shallow groundwater (trench) - µg/L; groundwater (indoor air—vapor intrusion) and shallow groundwater (trench air) - µg/m³

[c] The COPCs contributing to the ELCR and HI exceedances are summarized in Tables 10.1 through 10.5 in Attachment 1 of Appendix A-6.

Step 4: Final COC Determination

For groundwater (potable use) and indoor air (VI of groundwater) by future hypothetical residents, the target organ–specific HIs exceeded USEPA's threshold of 1 and the cumulative ELCR exceeded USEPA's acceptable risk range (1×10^{-6} to 1×10^{-4}) due to the COPCs indicated below:

Future Hypothetical Resident		
Groundwater Exposure Pathway	**Chemicals Causing Receptor Target Organ HI > 1**	**Chemicals Causing Receptor ELCR > 1 × 10^{-4}**
Potable use	2-Amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, arsenic, barium, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2,4-trimethylbenzene, 1,2-dichloroethane, acetone, benzene, cis-1,2-dichloroethene, methyl ethyl ketone, methylene chloride, PCE, toluene, TCE, vinyl chloride, m,p-xylene, and o-xylene	RDX, arsenic, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,2-dichloroethane, benzene, ethylbenzene, methylene chloride, naphthalene, PCE, TCE, and vinyl chloride
Indoor air (VI)	1,1,1-Trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2,4-trimethylbenzene, 1,2-dichloroethane, benzene, cis-1,2-dichloroethene, PCE, TCE, vinyl chloride, m,p-xylene, and o-xylene	1,1-Dichloroethane, 1,2-dichloroethane, benzene, ethylbenzene, PCE, TCE, and vinyl chloride

The federal MCLs for the COPCs (potable use) are presented below:

Chemical	**Maximum Detected Concentration (µg/L)**	**MCL (µg/L)**	**Exceeds MCL?**	**Groundwater COC for Potable Use Scenario?**
1,1,1-Trichloroethane	2,000	200	Yes	Yes
1,1,2-Trichloroethane	2.5	5	No	No
1,1-Dichloroethane	4,900	NA	NA	Yes
1,1-Dichloroethene	270	7	Yes	Yes
1,2,4-Trimethylbenzene	110	NA	NA	Yes
1,2-Dichloroethane	81	5	Yes	Yes
2-Amino-4,6-dinitrotoluene	1.2	NA	NA	Yes
4-Amino-2,6-dinitrotoluene	4.4	NA	NA	Yes
Acetone	6,700	NA	NA	Yes
Arsenic	56	10	Yes	Yes
Barium	2,000	2,000	No	No
Benzene	88	5	Yes	Yes
cis-1,2-Dichloroethene	2,000	70	Yes	Yes
Ethylbenzene	130	700	No	No
Methyl ethyl ketone	5,100	NA	NA	Yes
Methyl isobutyl ketone	1,700	NA	NA	Yes
Methylene chloride	160	5	Yes	Yes
Naphthalene	10	NA	NA	Yes
RDX	5.1	NA	NA	Yes
Tetrachloroethene	59	5	Yes	Yes

Chemical	Maximum Detected Concentration (µg/L)	MCL (µg/L)	Exceeds MCL?	Groundwater COC for Potable Use Scenario?
Toluene	3,500	1,000	Yes	Yes
Trichloroethene	82	5	Yes	Yes
Vinyl chloride	510	2	Yes	Yes
Xylene, m,p-	570	NA	NA	Yes
Xylene, o-	210	NA	NA	Yes

Notes:

µg/L = microgram per liter

COC = chemical of concern

MCL = Maximum Contaminant Level

NA = not applicable

These chemicals were identified as COCs in groundwater for future hypothetical residents with the exception of one metal (barium) and two VOCs (1,1,2-trichloroethane and ethylbenzene), which were detected at concentrations less than their respective MCLs. These chemicals were not identified as COCs in groundwater at the FTP for potable use. However, 1,1,2-trichloroethane and ethylbenzene were identified as COCs for indoor air (i.e., VI in groundwater), as shown in Appendix A-6, Attachment 1, Tables 10.3–10.5.

Because COCs were identified for future hypothetical residents, potential exposures and risks and hazards were also estimated for future site workers and construction/utility workers (summarized in Table 5.5-5).

For groundwater (potable use) and indoor air (VI of groundwater) for future site workers, the target organ–specific HIs exceeded USEPA's threshold of 1, and the cumulative ELCR exceeded USEPA's acceptable risk range (1×10^{-6} to 1×10^{-4}) due to the COPCs indicated below:

Future Site Worker		
Groundwater Exposure Pathway	**Chemicals Causing Receptor Target Organ HI > 1**	**Chemicals Causing Receptor ELCR > 1×10^{-4}**
Potable use	4-Amino-2,6-dinitrotoluene, arsenic, 1,1-dichloroethane, cis-1,2-dichloroethene, methylene chloride, TCE, and vinyl chloride	Arsenic, 1,1-dichloroethane, 1,2-dichloroethane, benzene, naphthalene, TCE, and vinyl chloride
Indoor air (VI)	1,1-Dichloroethene, cis-1,2- dichloroethene, TCE, and vinyl chloride	1,1-Dichloroethane, 1,2-dichloroethane, benzene, ethylbenzene, TCE, and vinyl chloride

For contact with shallow groundwater by future construction/utility workers, the target organ–specific HIs exceeded USEPA's threshold of 1 due to the COPCs indicated below; the cumulative ELCR did not exceed USEPA's acceptable risk range (1×10^{-6} to 1×10^{-4}):

Future Construction/Utility Worker		
Groundwater Exposure Pathway	**Chemicals Causing Receptor Target Organ HI > 1**	**Chemicals Causing Receptor ELCR > 1×10^{-4}**
Shallow Groundwater	TCE	

Trench air	Naphthalene, benzene, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, PCE, toluene, TCE, vinyl chloride, m,p-xylene, and o-xylene	None

In summary, the following COCs were identified for groundwater, as presented in tables in Appendix A-6, Attachment 1:

Chemical	**Site Workers (Table 10.1)**	**Construction/Utility Workers (Table 10.2)**	**Hypothetical Residents (Tables 10.3–10.5)**
1,1,1-Trichloroethane			X
1,1,2-Trichloroethane			X
1,1-Dichloroethane	X		X
1,1-Dichloroethene	X		X
1,2,4-Trimethylbenzene			X
1,2-Dichloroethane	X		X
2-Amino-4,6-dinitrotoluene			X
4-Amino-2,6-dinitrotoluene	X		X
Acetone			X
Arsenic	X		X
Benzene	X	X	X
cis-1,2-Dichloroethene	X		X
Ethylbenzene	X		X
Methyl ethyl ketone		X	X
Methyl isobutyl ketone		X	X
Methylene chloride	X	X	X
Naphthalene	X	X	X
RDX			X
Tetrachloroethene		X	X
Toluene		X	X
Trichloroethene	X	X	X
Vinyl chloride	X	X	X
Xylene, m,p-		X	X
Xylene, o-		X	X

5.5.6.6 Uncertainty Analysis

The assumptions used in the HHRAs have inherent uncertainty. The general uncertainties associated with the HHRAs for the sites in this RI report are provided in Section 4.3.1. This section provides additional site-specific uncertainties associated with the HHRA for the FTP that are not included in Section 4.3.1.

The maximum RL of detected chemicals not identified as COPCs in the RAGS Table 2 Series (Appendix A-2, Attachment 1) was compared to their respective RSL. However, chemicals whose RL exceeds the RSL were not identified as COPC. For the FTP, RLs exceeded RSLs for one metal (selenium) and two VOCs (1,2-dichlorobenzene and trans-1,2-dichloroethene). Although the RLs for these detected chemicals are greater than the RSLs, based on the frequency of exceedance, probable chemical interference from detected VOCs and comparison to historically detected chemicals in groundwater at IAAAP, further consideration of these detected chemicals does not appear warranted in the FTP HHRA.

Hazard estimates for 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, and 1,2-dichloroethane could be over- or underestimated because screening RfDs were used in the risk calculations. For example, as stated in the PPRTV document for 4-amino-2,6-dinitrotoluene (USEPA, 2020c),

> It is inappropriate to derive a subchronic or chronic provisional RfD for 4-amino-2,6-dinitrotoluene. However, information is available which, although insufficient to support derivation of a provisional toxicity value, under current guidelines, may be of limited use to risk assessors.… Users of screening toxicity values in an appendix to a PPRTV assessment should understand that there is considerably more uncertainty associated with the derivation of a supplemental screening toxicity value than for a value presented in the body of the assessment.

Chemicals that were 100 percent not detected in an exposure medium were not included in the COPC identification process; however, they were evaluated in a separate screening to determine whether elevated nondetected results were present in site media. The detailed analysis of the nondetected chemicals at the FTP is provided in Appendix A-6, Attachment 4. In summary, four explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene, and nitrobenzene), two metals (chromium and mercury), three SVOCs, and 21 VOCs had RLs or DLs exceeding SLs at the FTP. Although the maximum DLs and/or RLs for these nondetect chemicals are greater than the SLs, based on the frequency of exceedance, comparison to historically detected chemicals in groundwater at IAAAP, and acceptably low DLs and RLs for most samples, further consideration of nondetect chemicals does not appear warranted in the FTP HHRA.

5.5.6.7 Summary of HHRA

An HHRA was prepared for the FTP to evaluate potential current and future health risks from exposure to chemicals in site groundwater. The FTP is currently inactive, and former buildings have been demolished. The site is open to recreational activities, and hunting is permitted within the site boundary; however, there are no perennial surface water bodies within the FTP site boundary. Therefore, there are no potentially complete exposure pathways identified under current site conditions.

The following potential future human receptors were identified in the HHRA for the FTP:

- **Future Site Workers.** Future site workers could contact groundwater based on potential future use as a drinking water source at the FTP. If buildings are constructed onsite, future site workers could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in future buildings.
- **Future Construction/Utility Workers.** Future construction/utility workers could contact shallow groundwater while replacing a culvert located within the VOC plume.
- **Future Hypothetical Residents.** Future hypothetical residents could contact groundwater based on potential future use as a drinking water source at the FTP and could be exposed to indoor air (that may be impacted by VOCs migrating from groundwater) in future buildings.

Potential exposures and risks and hazards to future site workers and construction/utility workers were estimated in the HHRA since estimated risks and hazards for a hypothetical residential scenario exceeded acceptable risk and hazard levels and COCs were identified for a residential scenario.

The COPCs (site-related COPCs or naturally occurring chemicals) identified in site groundwater are as follows:

- Groundwater (potable use):
  - Naturally occurring: none.
  - Site-related: 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, RDX, arsenic, barium, naphthalene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2,4-trimethylbenzene, 1,2-dichloroethane, 1,3,5-trimethylbenzene, acetone, benzene, chloroform, cis-1,2-dichloroethene, ethylbenzene, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, tetrachloroethene, toluene, trichloroethene, vinyl chloride, m,p-xylene, and o-xylene.
- Groundwater (vapor intrusion):
  - Naturally occurring: none.
  - Site-related: 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2,4-trimethylbenzene, 1,2-dichloroethane, benzene, cis-1,2- dichloroethane, ethylbenzene, tetrachloroethene, trichloroethene, vinyl chloride, m,p-xylene, and o-xylene.
- Groundwater (trench scenario):
  - Naturally occurring: none.
  - Site-related: 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, RDX, arsenic, barium, naphthalene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2,4-trimethylbenzene, 1,2-dichloroethane, 1,3,5-trimethylbenzene, acetone, benzene, chloroform, cis-1,2-dichloroethene, ethylbenzene, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, tetrachloroethene, toluene, trichloroethene, vinyl chloride, m,p-xylene, and o-xylene.

The risk characterization for the FTP was completed using a four-step process, as discussed in Section 4.3.1. Step 1 presents the total combined risks and hazards from site-related COPCs and naturally occurring chemicals. Step 2 presents the risks and hazards from naturally occurring chemicals; however, no naturally occurring chemicals were identified in groundwater at the FTP. Step 3 presents the risks and hazards from site-related COPCs, as summarized in Table 5.5-5.

Unacceptable groundwater risks and hazards were identified in Step 3 for hypothetical residents, and in Step 4, explosives, VOCs, and one metal (arsenic) were identified as COCs for future hypothetical residents. Therefore, groundwater risks and hazards were also estimated for future site workers and construction/utility workers. For future site workers, explosives and VOCs were identified as COCs in groundwater; for future construction/utility workers, VOCs were identified as COCs in shallow groundwater.

In summary, the following COCs were identified for groundwater:

Future Site Worker	Future Construction / Utility Worker	Future Hypothetical Resident
1,1-Dichloroethane	Benzene	1,1,1-Trichloroethane
1,1-Dichloroethene	Naphthalene	1,1,2-Trichloroethane
1,2-Dichloroethane	Methyl ethyl ketone	1,1-Dichloroethane
4-Amino-2,6-dinitrotoluene	Methyl isobutyl ketone	1,1-Dichloroethene

Future Site Worker	Future Construction / Utility Worker	Future Hypothetical Resident
Arsenic	Methylene chloride	1,2,4-Trimethylbenzene
Benzene	Tetrachloroethene	1,2-Dichloroethane
cis-1,2- Dichloroethane	Toluene	2-Amino-4,6-dinitrotoluene
Ethylbenzene	TCE	4-Amino-2,6-dinitrotoluene
Methylene chloride	Vinyl chloride	Acetone
Naphthalene	Xylene, m,p-	Arsenic
TCE	Xylene, o-	Benzene
Vinyl chloride		cis-1,2-Dichloroethene
		Ethylbenzene
		Methyl ethyl ketone
		Methyl isobutyl ketone
		Methylene chloride
		Naphthalene
		RDX
		Tetrachloroethene
		Toluene
		Trichloroethene
		Vinyl chloride
		Xylene, m,p-
		Xylene, o-

5.5.7 Ecological Risk Assessment

The ERA for groundwater at the FTP is presented herein, beginning with Step 1 of the ERA process (to determine whether there are complete exposure pathways). Soil at the FTP is already addressed under the remedy for OU-1. There are no perennial surface water features within the FTP boundary; however, Spring Creek is present east of the FTP. A summary of the ERA conclusions for Spring Creek are provided in the ERA for the WBPA (Section 5.2.7).

Groundwater is present onsite, but ecological receptors are not exposed directly to groundwater; nevertheless, groundwater is a transport medium, and contaminated groundwater has potential to migrate to and discharge to surface water bodies. There is a lack of perennial surface water bodies on the FTP. Therefore, the groundwater-to-surface-water exposure pathway is incomplete. There are no complete exposure pathways for ecological receptors on the site. Therefore, there are no adverse effects identified and no additional actions are required from an ecological perspective.

5.5.8 Conclusions and Recommendations

An RI was conducted for the FTP to refine the nature and extent of contamination in groundwater from historical activities and assess for potentially unacceptable risk to human health and adverse effects to the environment. Analytical data available for groundwater at FTP includes VOCs, SVOCs, PAHs, explosives, metals, PCBs, radionuclides, and pesticides. Of these, VOCs, explosives, and metals were identified as site-related chemicals of interest based on historical site operations and a comparison of concentration data to site characterization PALs and BTVs (See Section 4.1). The FTP was identified as an AOPI during a Preliminary Assessment for PFAS at IAAAP (Arcadis, 2020). The PFAS AOPIs are currently under a site inspection, and therefore PFAS is not a component of this OU-10 RI.

In groundwater, 13 VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,2,4-trimethylbenzene, 1,2-dichloroethane, benzene, cis-1,2-DCE, methylene chloride, PCE, TCE, toluene, vinyl chloride, and o-xylene), two explosives, and one metal (arsenic) were detected above their site characterization PALs or BTVs (if available) during the most recent sampling event in 2019. VOC groundwater contamination is present as one large plume, with the majority of VOC contamination within the footprint of the former main training pit and 1998 soil removal area. The VOC plume is considered to be laterally and vertically delineated. On the contrary, the explosives plume is isolated to the sump well (SA-99-1), located within the 1998 removal area. Arsenic groundwater contamination was observed within the vicinity of the former training pit and 1998 soil removal area, and arsenic concentrations have been fairly consistent in this area since 2001. The slow groundwater flow velocity and natural attenuation processes are likely helping to limit the extent of plume migration. As such, no contaminant exceedances have been observed in the most downgradient monitoring wells in this area.

The soil removals that were completed in 1998 and 2003 are assumed to have removed the bulk of VOC contamination that could be a source to groundwater. Confirmation samples were below the excavation criteria.

An HHRA and an ERA were conducted to quantify potential risks and hazards to human health and the environment from exposure to contaminants at the FTP. The following conclusions were made based on the risk assessments:

- The HHRA identified potentially unacceptable risks and hazards for the following receptors from exposure to groundwater at the FTP:

Site Receptor	Chemicals (COCs)
Site Workers	1,1-Dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 4-amino-2,6-dinitrotoluene, arsenic, benzene, ethylbenzene, methylene chloride, naphthalene, TCE, and vinyl chloride
Construction/Utility Workers	Benzene, naphthalene, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, tetrachloroethene, toluene, TCE, vinyl chloride, m,p-xylene, and o-xylene
Hypothetical Residents	1,1,1-Trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2,4-trimethylbenzene, 1,2-dichloroethane, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, acetone, arsenic, benzene, cis-1,2-DCE, ethylbenzene, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, RDX, PCE, toluene, TCE, vinyl chloride, m,p-xylene, and o-xylene

- The ERA concluded that there are no adverse effects to ecological receptors identified and no additional actions are required from an ecological perspective.

Based on the results of the RI and risk assessments, additional action is warranted to mitigate potentially unacceptable risks to future receptors from site-related COCs in groundwater (VOCs, explosives, and arsenic). It is recommended that an FS should be completed under OU-10 to evaluate remedial alternatives to address the unacceptable risks in groundwater at the FTP (IAAP-039G). When developing remedial alternatives, the FS should consider the reasonably foreseeable future land use for this area.

OU-10 Conclusions and Recommendations Summary

An RI was conducted for the environmental sites within the EDA to refine the nature and extent of contamination in applicable media from historical activities, assess for potentially unacceptable risk to human health and adverse effects to the environment, and recommend a path forward.

6.1 RI Conclusions

6.1.1 EBPs (IAAP-012G)

Potential sources of contamination at the EBPs include historical activities associated with open burning of explosives-contaminated metals, propellants, explosives, and pyrotechnic-contaminated materials. Available documentation does not indicate that petroleum fuels or other liquid accelerants were used for open burning operations. Explosive powder that was used to initiate the flashing was spread on top of materials placed on the burn pads. Live ordnance was not demilitarized (Tetra Tech, 2006). Scrap metal was recovered for offsite recycling, and ash and other debris were disposed of offsite. Operations at the EBPs ceased once the EWI was constructed in 1982.

Based on historical site operations and a comparison of the most current concentration data to site characterization project action limits (PALs) and background threshold values (BTVs), only RDX was identified as a potential site-related chemical of interest in groundwater. RDX groundwater contamination is present as one large plume, which exists primarily within the overburden aquifer. It was detected above its site characterization PAL in only four overburden and shallow bedrock monitoring wells during the latest sampling events (EBP-MW3, EBP-MW4, EBP-MW5, and EDA-2). Although RDX concentrations in three out of the four wells have decreased since late 2007, increasing trends at monitoring wells EBP-MW4 and EDA-3, located at the leading edge of the plume, may be indicative of some plume migration. However, the overburden aquifer is absent in the western portion of the site, where it pinches out and bedrock outcrops to the surface. Along with the slow groundwater flow velocity, this may be limiting the extent of plume migration. As such, no RDX exceedances have been observed in the most downgradient monitoring wells at the site. The RDX plume is considered to be laterally and vertically delineated.

The soil removal that was completed in 1999 is assumed to have removed the bulk of RDX contamination that could be a source to groundwater. Although initial confirmation sampling showed RDX concentrations above the OU-1 leachability-based RG (1.3 mg/kg) at Pads 1E, 2E, 4E, 5E, 6E, and 8E, an additional 1 to 2 feet of soil was excavated in these areas following the confirmation sampling. Because a second round of confirmation sampling was not conducted, it is unknown whether RDX concentrations in soil still exceeded the leachability goal at the EBPs.

The HHRA did not identify any unacceptable risks or hazards for future residential receptors exposed to site-related chemicals in groundwater at the EBPs. The ERA concluded that no adverse effects to ecological receptors exist at the EBPs, given the lack of complete exposure pathways for ecological receptors.

6.1.2 WBPA (IAAP-032G)

Potential sources of contamination at WBPA include historical activities associated with open burning demilitarization activities and burning and disposal of dunnage. Open burning was performed on a variety of munitions debris and related materials, including explosives-contaminated metals parts and inert and explosives-contaminated packaging. Recoverable metal was segregated for offsite recycling and reuse subsequent to burning. Land disposal was performed at onsite landfills for other wastes from burning operations, including ash, paper, wood, and metal cans. Burning and disposal operations at the WBPA ceased after the EWI was constructed in 1982.

Based on historical site operations and a comparison of the most current concentration data to site characterization PALs and BTVs, three explosives (RDX, 2,6-DNT, and 1,3-dinitrobenzene), four VOCs (1,1,2-trichlorotrifluoroethane [Freon 113], 1,1-dichloroethane, 1,1-DCE, and TCE) and one metal (arsenic) were identified as potential site-related chemicals of interest in groundwater. RDX is the most extensive chemical, and the other explosives are present within the RDX plume extents. RDX is present primarily as one large plume, which exists primarily within the overburden and shallow bedrock aquifers. The soil removals are assumed to have removed the bulk of RDX contamination that could be a source to groundwater. However, confirmation samples collected in 2000 from the four excavation areas (WBP Landfill, Pad 2-W, Burn Cage Ash Landfill, and Pad 1-W) indicated that RDX was still present above OU-1 leachability RGs (ECC, 2001), which could be a continuing source at the WBPA. VOCs are present in three plumes at the WBPA, two in the northern portion of the WBPA and one in the eastern portion of the WBPA. Of note is a large VOC plume that extends into the southeastern corner of the WBPA; however, this plume is associated with the FTP site (IAAP-039). Arsenic exceeded its PAL and BTV at only one well in 2019.

A groundwater treatability study was conducted from 2005 through 2009 in the northwest portion of the RDX plume, near WBP-TTMW-05B, and in the southeast portion of the RDX plume, near WBP-99-3, where historically the highest RDX and Freon 113 concentrations had been observed. Stable and decreasing RDX concentrations are north and east of the RDX plume; however, some increasing trends may be indicative of some plume migration or rebound following the treatability study injections. However, the slow groundwater flow velocity should be limiting the extent of plume migration. The RDX plume is considered to be laterally and vertically delineated for this RI. In surface water, only dissolved aluminum was detected above its site characterization PAL and BTV in 2019, downstream of the EDA. Dissolved aluminum was not detected upstream of the EDA in 2019. No site-related chemicals of interest were identified for sediment.

The HHRA identified potentially unacceptable risks for future hypothetical residential receptors exposed to site-related chemicals in groundwater at the WBPA, including VOCs, explosives, and arsenic. The HHRA also identified potentially unacceptable risks associated with exposure to Freon 113, 1,3-dinitrobenzene, 2,6-dinitrotoluene, arsenic, chloroform, dichlorodifluoromethane, RDX, and TCE for current and/or future site workers and to TCE for construction/utility workers. The HHRA concluded that there are no unacceptable risks or hazards for hypothetical residents from exposure to surface water or sediment at the WBPA.

The ERA concluded that no adverse effects to ecological receptors exist at the WBPA. Surface water and sediment data were evaluated in the 2022 Watershed ERA (Appendix I) for the Spring Creek watershed. From the SLERA, copper and silver in sediment were identified as COPECs; these COPECs were carried forward into the BERA for the 2022 Watershed ERA. No chemicals were identified as COPECs in surface water. Following the weight-of-evidence evaluation, no COPECs were identified for Spring Creek. The recommendation of NFA for the Spring Creek watershed based on the results of the Watershed ERA (Appendix I) means that no ecological impacts are expected at the WBPA.

6.1.3 NBPs (IAAP-036G)

Potential sources of contamination at NBPs include historical activities associated with open burning activities, including of lead azide and gunpowder. Incomplete combustion of explosives compounds and metals from ash released to soil may have leached into groundwater.

Based on historical site operations and a comparison of the most current concentration data to site characterization PALs and BTVs, no contaminants were detected as potential site-related chemicals of interest in groundwater. Historically, explosives, VOCs, and metals were identified as chemicals of interest in groundwater at the NBPs; however, metals and VOCs have been detected below screening criteria since 2000, and no explosives were detected above their respective PALs in 2019. Freon 113 was detected in groundwater in one well in 2019; however, concentrations were below the site characterization PAL, which differs from the screening value used for HHRA. This well (JAW-13) is located near the southern boundary of the NBPs and may represent the northern edge of VOCs observed in groundwater at the WBPA. Given the lack of RDX in groundwater during the current RI, the soil removal that was completed in 1998 is assumed to have removed RDX contamination that could be a source to groundwater.

The HHRA identified potentially unacceptable risks and hazards from exposure to Freon 113 through a potential VI pathway. Therefore, this analyte was identified as a potential VI COC for future hypothetical residents. The ERA concluded that no adverse effects to ecological receptors exist at the NBPs, given the lack of complete exposure pathways for ecological receptors.

6.1.4 NBPLF (IAAP-037G)

Potential sources of contamination at NBPLF include historical activities associated with releases to the surface and subsurface as a result of historical site operations, including burial of waste within the NBPLF. The NBPLF was formerly used for disposal of ash residue from NPB burning operations, as well as flashed cans, containers, and construction debris. The site is no longer an active landfill and is currently used for temporary waste storage, including slightly contaminated explosives waste, which is placed in dumpsters and shipped offsite for disposal at approved facilities.

Based on historical site operations and a comparison of the most current concentration data to site characterization PALs and BTVs, only one explosive (RDX) was identified as a potential site-related chemical of interest in groundwater. RDX contamination has been observed as two small plumes at the NBPLF. The main RDX plume is present at the NBPLF to the east of the former landfill and is restricted to within the shallow bedrock. The second RDX plume is isolated and was historically defined by former overburden well JAW-625. However, RDX was not detected in nearby NBPLF-MW1 during the current RI. Therefore, RDX concentrations in this second plume may have attenuated below the site characterization PAL. Explosives were detected above their site characterization PALs in only three shallow bedrock monitoring wells in 2019 and 2020 (JAW-627, NBPLF-MW4, and NBPLF-MW6). RDX concentrations at JAW-627 have been increasing since 2001. The soil removal that was completed in 1998 is assumed to have removed the bulk of RDX contamination that could be a source to groundwater. Confirmation sampling showed one RDX concentration (2.5 mg/kg) within the former NBPLF above the OU-1 leachability-based RG (1.3 mg/kg). However, the increasing RDX concentrations at JAW-627 indicate there may still be a source of RDX leaching to groundwater from the former landfill. Increasing RDX concentrations may also be indicative of continued plume migration. No RDX was detected in surface water samples collected in 2018, due northeast and southeast of the NBPLF, which indicates that the eastern plume is defined. The RDX is considered to be laterally and vertically delineated for this RI.

The HHRA did not identify any unacceptable risks or hazards for future residential receptors exposed to site-related chemicals in groundwater at the NBPLF. The ERA concluded that no adverse effects to ecological receptors exist at the NBPLF, given the lack of complete exposure pathways for ecological receptors.

6.1.5 FTP (IAAP-039G)

Potential sources of contamination at FTP area include historical activities associated with chemical use, burning, and disposal. The former training pit was used for firefighting training operations between 1982 and 1987. Two smaller pits existed to the north of the main training pit, one disposal pit contained trash and debris, and another pit was used to burn wastes similar to those used in the firefighting practices in the main pit, though this disposal pit was not used for firefighter training.

Based on historical site operations and a comparison of the most current concentration data to site characterization PALs) and BTVs, VOCs, explosives, and arsenic were identified as potential site-related chemicals of interest in groundwater. Numerous VOCs associated with chlorinated solvents, fuels, and associated breakdown products have been detected at the FTP. Historically, 1,1-DCE and 1,1-DCA have exceeded their PALs with the greatest frequency. VOC groundwater contamination is present as one large plume, with the majority of VOC contamination within the footprint of the former main training pit and a soil removal area. The explosives plume is isolated to the sump well (SA-99-1), located within the soil removal area. Arsenic groundwater contamination was observed within the vicinity of the former training pit and soil removal area and arsenic concentrations have been fairly consistent in this area since 2001. The slow groundwater flow velocity and natural attenuation processes are likely helping to limit the extent of plume migration. As such, no contaminant exceedances have been observed in the most downgradient monitoring wells in this area. The VOC plume is considered to be laterally and vertically delineated for this RI.

The HHRA identified potentially unacceptable risks for future residential receptors exposed to site-related chemicals in groundwater at the FTP, including VOCs, explosives, and arsenic. The HHRA also identified potentially unacceptable risks associated with exposure to 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 4-amino-2,6-dinitrotoluene, arsenic, benzene, cis-1,2-dichloroethane, ethylbenzene, methylene chloride, naphthalene, TCE, and vinyl chloride for site workers and benzene, naphthalene, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, tetrachloroethene, toluene, TCE, vinyl chloride, m,p-xylene, and o-xylene for construction/utility workers. The ERA concluded that no adverse effects to ecological receptors exist at the FTP, given the lack of complete exposure pathways for ecological receptors.

6.2 Recommendations

it is recommended that the five IAAAP groundwater sites (IAAP-012G, IAAP-032G, IAAP-036G, IAAP-037G, and IAAP-039G) included in this RI report be transferred to a new OU (OU-10). The new OU-10 grouping will include Environmental Restoration sites located within the EDA. Based on the RI conclusions and results of human health risk assessments and ecological risk assessments, the following is also recommended:

- Conduct a Feasibility Study (FS) for three sites (IAAP-032G, IAAP-036G, and IAAP-039G) associated with groundwater at the WBPA, NBPs, and the FTP to evaluate remedial alternatives to address the unacceptable risks or hazards from site-related COCs in groundwater. If appropriate, it is recommended that TCE reductive degradation products (such as cis-1,2-DCE and vinyl chloride) be included in the monitoring plans of the FS remedial alternatives. NFA is warranted for surface water and sediment at the WBPA under IAAP-032G.
- Propose a NFA decision in a Proposed Plan as the preferred remedy for one site (IAAP-012G) associated with groundwater at the EBPs. This recommendation is based on the fact that site-related chemicals do not pose potentially unacceptable risks or hazards. This IAAAP site can subsequently be closed under an NFA Record of Decision for OU-10.
- Conduct a Supplemental Remedial Investigation (SRI) for one site (IAAP-037G). The results of the RI and risk assessments indicate that site-related chemicals do not pose potentially unacceptable risks

or hazards. However, because increasing RDX concentrations have been observed in groundwater at JAW-627 and not all RDX in soil was removed at this site to the OU-1 leachability RG, additional groundwater monitoring at JAW-627 is recommended to provide a further line of evidence that a NFA decision is warranted for the NBPLF.

- Retain the two munition IAAAP sites (IAAP-003-R-01 and IAAP-005-R-01) under OU-5. These two Military Munitions Response Program sites have already been closed as NFA for munitions and explosives of concern (MEC) and munitions chemicals (MC) under the OU-5 ROD (CB&I, 2014); therefore, no additional action is needed for these sites and they can remain closed. These recommendations for the OU-5 sites can be documented in the next five-year review report for IAAAP, which includes the IRP OUs with remedies in place (OU-1, OU-3, OU-4, and OU-5).
- Repair the new EDA staff gauges to obtain accurate measurements in the future. Between staff gauge installation in 2018 and the 2019 RI gauging event, the three new staff gauges (EDA-1 through EDA-3) were damaged.

The RI recommendations are summarized below.

	Army Environmental Database Information	
RI Recommendation	**Site Number**	**Site Name**
FS for groundwater under OU-10	IAAP-036G	North Burn Pads Groundwater
	IAAP-039G	Fire Training Pit Groundwater
FS for groundwater and NFA for surface water and sediment under OU-10	IAAP-032G	West Burn Pad Area Groundwater
NFA for groundwater under OU-10	IAAP-012G	East Burn Pads Groundwater
SRI for groundwater under OU-10	IAAP-037G	North Burn Pad Landfill Groundwater
NFA under OU-5[a]	IAAP-003-R-01	West Burn Pads
	IAAP-005-R-01	West Burn Pads South of Road

[a] NFA is already documented in the OU-5 ROD.

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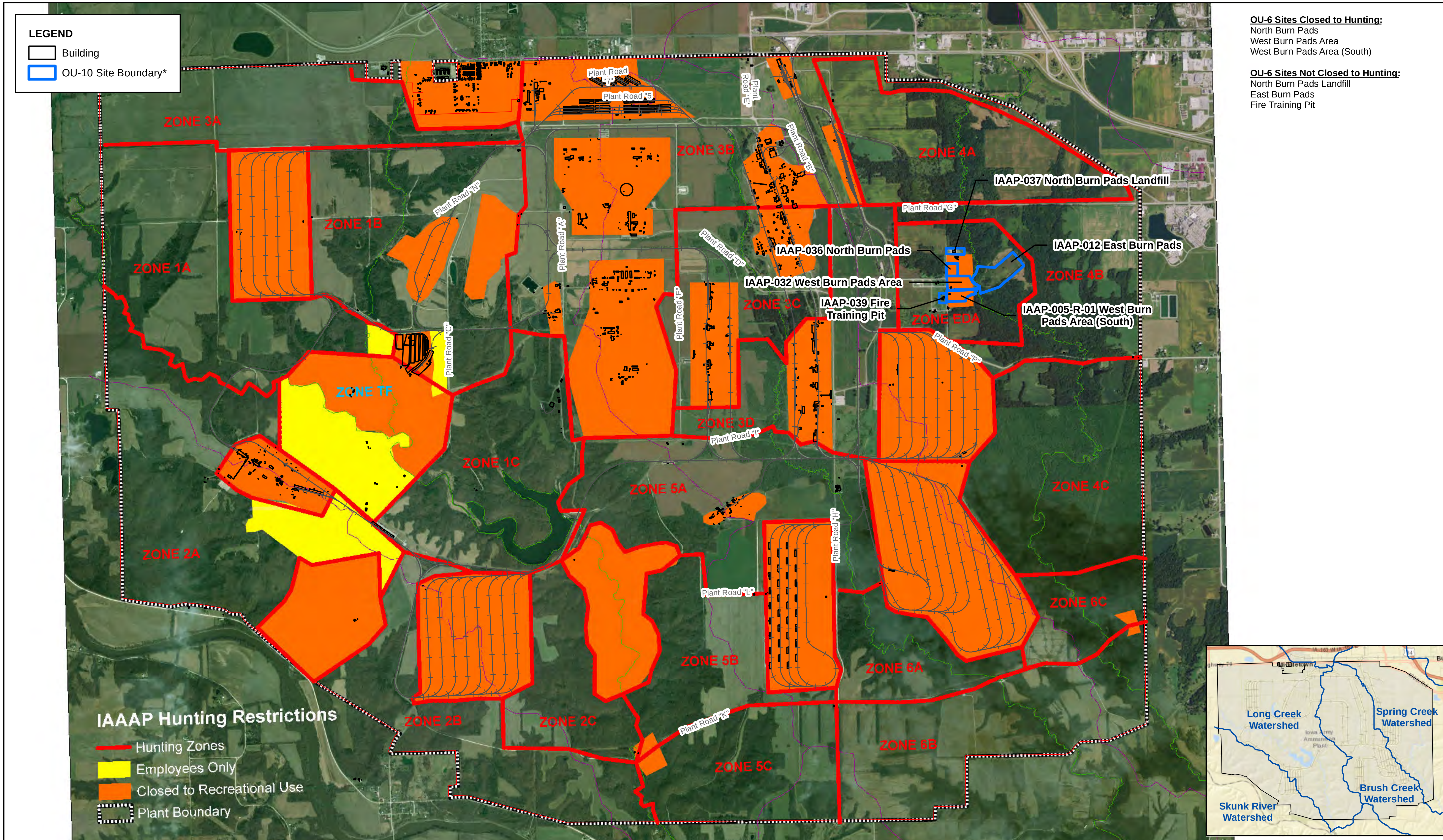
Appendix A
Human Health Risk Assessment



Note:
OU-10 sites that allow hunting activities include the North Burn Pads Landfill, East Burn Pads, and Fire Training Pit. Recreational use is not allowed at the North Burn Pads, West Burn Pads Area, and West Burn Pads Area (South).

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Figure A-1
Hunting Leases
Iowa Army Ammunition Plant
Middletown, Iowa

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Attachment 2. Active Buildings at OU-10 Areas, Human Health Risk Assessment

Iowa Army Ammunition Plant, Middletown, Iowa

Site	Active Buildings
East Burn Pads	None
West Burn Pads Area	BG-13
North Burn Pads	None
North Burn Pads Landfill	BG-199-4
Fire Training Pit	None

Attachment 3. VISL Calculator Output

Iowa Army Ammunition Plant, Middletown, Iowa

Default VISL Results

Resident Equation Inputs

Variable	Value
Exposure Scenario	Resident
Temperature for Groundwater Vapor Concentration C	13
ED_{res} (exposure duration) years	26
TR (target risk) unitless	0.000001
THQ (target hazard quotient) unitless	0.1
LT (lifetime) years	70
EF_{res} (exposure frequency) days/year	350
ED_{0-2} (mutagenic exposure duration first phase) years	2
ED_{2-6} (mutagenic exposure duration second phase) years	4
ED_{6-16} (mutagenic exposure duration third phase) years	10
ED_{16-26} (mutagenic exposure duration fourth phase) years	10
EF_{0-2} (mutagenic exposure frequency first phase) days/year	350
EF_{2-6} (mutagenic exposure frequency second phase) days/year	350
EF_{6-16} (mutagenic exposure frequency third phase) days/year	350
EF_{16-26} (mutagenic exposure frequency fourth phase) days/year	350
ET_{res} (exposure time) hours/day	24
ET_{0-2} (mutagenic exposure time first phase) hours/day	24
ET_{2-6} (mutagenic exposure time second phase) hours/day	24
ET_{6-16} (mutagenic exposure time third phase) hours/day	24
ET_{16-26} (mutagenic exposure time fourth phase) hours/day	24
AF_{gw} (Attenuation Factor Groundwater) unitless	0.001
AF_{ss} (Attenuation Factor Sub-Slab) unitless	0.03

Attachment 3. VISL Calculator Output—Resident Vapor Intrusion Screening Levels (VISL)

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical	CAS Number	Does the chemical meet the definition for volatility? (HLC>1E-5 or VP>1)	Does the chemical have inhalation toxicity data? (IUR and/or RfC)	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source? ($C_{vp} > C_{i,a}$,Target?)	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source? ($C_{hc} > C_{i,a}$,Target?)	Target Indoor Air Concentration (TCR=1E-06 or THQ=0.1) MIN($C_{ia,c}$,$C_{ia,nc}$) (µg/m^3)	Toxicity Basis	Target Sub-Slab and Near-source Soil Gas Concentration (TCR=1E-06 or THQ=0.1) C_{sg},Target (µg/m^3)	Target Groundwater Concentration (TCR=1E-06 or THQ=0.1) C_{gw},Target (µg/L)	Is Target Groundwater Concentration < MCL? (C_{gw} < MCL?)	Pure Phase Vapor Concentration C_{vp} (13 ºC) (µg/m^3)
Acetone	67-64-1	Yes	No	No Inhal. Tox. Info	No Inhal. Tox. Info	-		-	-		7.23E+08
Benzene	71-43-2	Yes	Yes	Yes	Yes	3.60E-01	CA	1.20E+01	2.70E+00	Yes (5)	3.98E+08
Bromomethane	74-83-9	Yes	Yes	Yes	Yes	5.21E-01	NC	1.74E+01	2.48E+00	--	8.25E+09
Butylbenzene, n-	104-51-8	Yes	No	No Inhal. Tox. Info	No Inhal. Tox. Info	-		-	-		7.68E+06
Butylbenzene, sec-	135-98-8	Yes	No	No Inhal. Tox. Info	No Inhal. Tox. Info	-		-	-		1.26E+07
Carbon Disulfide	75-15-0	Yes	Yes	Yes	Yes	7.30E+01	NC	2.43E+03	1.91E+02	--	1.47E+09
Chloroform	67-66-3	Yes	Yes	Yes	Yes	1.22E-01	CA	4.07E+00	1.33E+00	Yes (80)	1.26E+09
Chloromethane	74-87-3	Yes	Yes	Yes	Yes	9.39E+00	NC	3.13E+02	3.49E+01	--	1.17E+10
Cumene	98-82-8	Yes	Yes	Yes	Yes	4.17E+01	NC	1.39E+03	2.08E+02	--	2.91E+07
Dichlorodifluoromethane	75-71-8	Yes	Yes	Yes	Yes	1.04E+01	NC	3.48E+02	9.63E-01	--	3.15E+10
Dichloroethane, 1,1-	75-34-3	Yes	Yes	Yes	Yes	1.75E+00	CA	5.85E+01	1.24E+01	--	1.21E+09
Dichloroethane, 1,2-	107-06-2	Yes	Yes	Yes	Yes	1.08E-01	CA	3.60E+00	3.92E+00	Yes (5)	4.20E+08
Dichloroethylene, 1,1-	75-35-4	Yes	Yes	Yes	Yes	2.09E+01	NC	6.95E+02	2.97E+01	No (7)	3.13E+09
Dichloroethylene, cis-1,2-	156-59-2	Yes	Yes	Yes	Yes	4.17E+00	NC	1.39E+02	4.16E+01	Yes (70)	1.04E+09
Dichloroethylene, trans-1,2-	156-60-5	Yes	Yes	Yes	Yes	4.17E+00	NC	1.39E+02	1.75E+01	Yes (100)	1.73E+09
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	1.12E+00	CA	3.74E+01	6.85E+00	Yes (700)	5.48E+07
Methyl Ethyl Ketone (2-Butanone)	78-93-3	Yes	Yes	Yes	Yes	5.21E+02	NC	1.74E+04	3.89E+05	--	3.51E+08
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	8.26E-02	CA	2.75E+00	1.09E+01	--	5.86E+05
Nitrobenzene	98-95-3	Yes	Yes	Yes	Yes	7.02E-02	CA	2.34E+00	1.77E+02	--	1.62E+06
Propyl benzene	103-65-1	Yes	Yes	Yes	Yes	1.04E+02	NC	3.48E+03	5.16E+02	--	2.21E+07
Tetrachloroethylene	127-18-4	Yes	Yes	Yes	Yes	4.17E+00	NC	1.39E+02	1.09E+01	No (5)	1.65E+08
Toluene	108-88-3	Yes	Yes	Yes	Yes	5.21E+02	NC	1.74E+04	3.52E+03	No (1000)	1.41E+08
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	Yes	Yes	Yes	Yes	5.21E+02	NC	1.74E+04	3.80E+01	--	3.65E+09
Trichloroethane, 1,1,1-	71-55-6	Yes	Yes	Yes	Yes	5.21E+02	NC	1.74E+04	1.24E+03	No (200)	8.90E+08
Trichloroethylene	79-01-6	Yes	Yes	Yes	Yes	2.09E-01	NC	6.95E+00	8.97E-01	Yes (5)	4.88E+08
Trimethylbenzene, 1,2,4-	95-63-6	Yes	Yes	Yes	Yes	6.26E+00	NC	2.09E+02	5.44E+01	--	1.36E+07
Trimethylbenzene, 1,3,5-	108-67-8	Yes	Yes	Yes	Yes	6.26E+00	NC	2.09E+02	3.82E+01	--	1.60E+07
Xylene, o-	95-47-6	Yes	Yes	Yes	Yes	1.04E+01	NC	3.48E+02	9.85E+01	--	3.77E+07
Xylenes	1330-20-7	Yes	Yes	Yes	Yes	1.04E+01	NC	3.48E+02	7.59E+01	Yes (10000)	4.56E+07

Attachment 3. VISL Calculator Output—Resident Vapor Intrusion Screening Levels (VISL)

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical	CAS Number	Maximum Groundwater Vapor Concentration C_{hc} (µg/m^3)	Temperature for Maximum Groundwater Vapor Concentration (°C)	Lower Explosive Limit LEL (% by volume)	LEL Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfC (mg/m^3)	RfC Ref	Mutagenic Indicator	Carcinogenic VISL TCR=1E-06 $C_{ia,c}$ (µg/m^3)	Noncarcinogenic VISL THQ=0.1 $C_{ia,nc}$ (µg/m^3)
Acetone	67-64-1	8.75E+08	1.30E+01	2.50E+00	CRC	-		-		No	-	-
Benzene	71-43-2	2.39E+08	1.30E+01	1.20E+00	CRC	7.80E-06	I	3.00E-02	I	No	3.60E-01	3.13E+00
Bromomethane	74-83-9	3.19E+09	1.30E+01	1.00E+01	CRC	-		5.00E-03	I	No	-	5.21E-01
Butylbenzene, n-	104-51-8	3.46E+06	1.30E+01	8.00E-01	CRC	-		-		No	-	-
Butylbenzene, sec-	135-98-8	4.84E+06	1.30E+01	8.00E-01	YAWS	-		-		No	-	-
Carbon Disulfide	75-15-0	8.27E+08	1.30E+01	1.30E+00	CRC	-		7.00E-01	I	No	-	7.30E+01
Chloroform	67-66-3	7.30E+08	1.30E+01	-		2.30E-05	I	9.77E-02	A	No	1.22E-01	1.02E+01
Chloromethane	74-87-3	1.43E+09	1.30E+01	8.10E+00	CRC	-		9.00E-02	I	No	-	9.39E+00
Cumene	98-82-8	1.23E+07	1.30E+01	9.00E-01	CRC	-		4.00E-01	I	No	-	4.17E+01
Dichlorodifluoromethane	75-71-8	3.03E+09	1.30E+01	-		-		1.00E-01	X	No	-	1.04E+01
Dichloroethane, 1,1-	75-34-3	7.14E+08	1.30E+01	5.40E+00	CRC	1.60E-06	C	-		No	1.75E+00	-
Dichloroethane, 1,2-	107-06-2	2.37E+08	1.30E+01	6.20E+00	CRC	2.60E-05	I	7.00E-03	P	No	1.08E-01	7.30E-01
Dichloroethylene, 1,1-	75-35-4	1.70E+09	1.30E+01	6.50E+00	CRC	-		2.00E-01	I	No	-	2.09E+01
Dichloroethylene, cis-1,2-	156-59-2	6.43E+08	1.30E+01	3.00E+00	CRC	-		4.00E-02	X	No	-	4.17E+00
Dichloroethylene, trans-1,2-	156-60-5	1.08E+09	1.30E+01	6.00E+00	CRC	-		4.00E-02	X	No	-	4.17E+00
Ethylbenzene	100-41-4	2.77E+07	1.30E+01	8.00E-01	CRC	2.50E-06	C	1.00E+00	I	No	1.12E+00	1.04E+02
Methyl Ethyl Ketone (2-Butanone)	78-93-3	2.99E+08	1.30E+01	1.40E+00	CRC	-		5.00E+00	I	No	-	5.21E+02
Naphthalene	91-20-3	2.34E+05	1.30E+01	9.00E-01	CRC	3.40E-05	C	3.00E-03	I	No	8.26E-02	3.13E-01
Nitrobenzene	98-95-3	8.31E+05	1.30E+01	1.80E+00	CRC	4.00E-05	I	9.00E-03	I	No	7.02E-02	9.39E-01
Propyl benzene	103-65-1	1.06E+07	1.30E+01	8.00E-01	CRC	-		1.00E+00	X	No	-	1.04E+02
Tetrachloroethylene	127-18-4	7.91E+07	1.30E+01	-		2.60E-07	I	4.00E-02	I	No	1.08E+01	4.17E+00
Toluene	108-88-3	7.80E+07	1.30E+01	1.10E+00	CRC	-		5.00E+00	I	No	-	5.21E+02
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	2.33E+09	1.30E+01	-		-		5.00E+00	P	No	-	5.21E+02
Trichloroethane, 1,1,1-	71-55-6	5.42E+08	1.30E+01	8.00E+00	CRC	-		5.00E+00	I	No	-	5.21E+02
Trichloroethylene	79-01-6	2.98E+08	1.30E+01	8.00E+00	CRC	4.10E-06	I	2.00E-03	I	Mut	4.78E-01	2.09E-01
Trimethylbenzene, 1,2,4-	95-63-6	6.55E+06	1.30E+01	9.00E-01	CRC	-		6.00E-02	I	No	-	6.26E+00
Trimethylbenzene, 1,3,5-	108-67-8	7.90E+06	1.30E+01	1.00E+00	CRC	-		6.00E-02	I	No	-	6.26E+00
Xylene, o-	95-47-6	1.88E+07	1.30E+01	9.00E-01	CRC	-		1.00E-01	G	No	-	1.04E+01
Xylenes	1330-20-7	1.46E+07	1.30E+01	-		-		1.00E-01	I	No	-	1.04E+01

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; G = see RSL User's Guide Section 5; CA = cancer; NC = noncancer.

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Attachment 4
Table 1. Exposure Factors for Hunter/Recreator Receptors
Iowa Army Ammunition Plant, Middletown, Iowa

Exposure Media	Parameter	Parameter Definition	Units	Adult		Adolescent	
				Value	Reference	Value	Reference
General Exposure Parameters	EF	Exposure Frequency	days/year	26	(1)	26	(1)
	ED	Exposure Duration	years	20	EPA, 2014 (2)	8	(3)
	BW	Body Weight	kg	80	EPA, 2014 (2)	44.3	(4)
	AT-N	Averaging Time (Non-Cancer)	days	7,300	(5)	2,920	(5)
	AT-C	Averaging Time (Cancer)	days	25,550	(6)	25,550	(6)
Soil or Sediment	IR-S/IR-SED	Ingestion Rate of Soil / Sediment	mg/day	100	EPA, 2014 (2)	100	EPA, 2014 (9)
	SA-S	Skin Surface Area Available for Contact - Soil	cm^2	6,032	EPA, 2014 (2)	6,032	EPA, 2014 (9)
	SA-SED	Skin Surface Area Available for Contact - Sediment	cm^2	7,567	EPA, 2011 (7)	7,567	EPA, 2014 (9)
	SSAF	Soil / Sediment-to-Skin Adherence Factor	mg/cm^2-day	0.07	EPA, 2014 (2)	0.07	EPA, 2014 (9)
	ET	Exposure Time	hours/day	2	(8)	2	(8)
Surface Water	IR-SW	Ingestion Rate of Water While Wading / Swimming	L/hour	0.021 / 0.092	EPA, 2019 (10)	0.021 / 0.092	EPA, 2019 (10)
	SA-w	Skin Surface Area Available for Contact - Wading	cm^2	7,567	EPA, 2011 (7)	7,567	EPA, 2011 (4)
	SA-s	Skin Surface Area Available for Contact - Swimming	cm^2	19,652	EPA, 2011 (11)	19,652	EPA, 2011 (4)
	ET	Exposure Time	hour/event	2	(8)	2	(8)
	t_{event}	Event Time	hour/event	2	(8)	2	(8)
	EV	Event Frequency	events/day	1	(8)	1	(8)

Notes;
(1) Exposure duration of 26 days/year is based on the assumption that hunting/recreation would occur 1 day/week during the approximately 6 months when the average temperature is above 32°F.
(2) Default exposure factor value for adult residents was used for hunters/recreators.
(3) Exposure duration of 8 years is based on adolescents aged 8 to 16 years of age. As described in the Hunting and Fishing Regulation of the Iowa Army Ammunition Plant Regulation 420-1 (August 2019), observers as young as 8 years old could be present at IAAAP.
(4) Adolescent body weight of 44.3 kg recommented by EPA.
(5) Calculated as the product of ED (years) x 365 days/year.
(6) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.
(7) Weighted average of mean values for head, hands, forearms, lower legs, and feet (male and female, 21+ years), Tables 7-2 and 7-12 from Exposure Factors Handbook (EPA, 2011).
(8) Exposure time of 2 hours/day (or 2 hours/event with 1 event/day) is based on professional judgment.
(9) Consistent with the approach in the RSL User's Guide (EPA, 2023), exposure factors for adult recreators were used for adolescent recreators.
(10) Ingestion rate while wading (0.021 L/hr) is the value recommended by the EPA in the letter dated 15 Aug 2018 regarding the Response to Comments on the Uniform Federal Policy – Quality Assurance Project Plan (UFP-QAPP), Packet #3. The ingestion rate while swimming (0.092 L/hr) is the 95th percentile ingestion rate for swimming for ages 21+ years (EPA, 2019a).
(11) Weighted average of mean values for male and female adults, 21-78, Table 7.9 from Exposure Factors Handbook (EPA, 2011).

References:
EPA, 2011. Exposure Factors Handbook: 2011 Edition. EPA/600/R-090/052F. September 2011.
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-18/259F, 2019.
EPA. 2023. Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

Acronyms:
cm^2: square centimeter
kg: kilogram
L/hour: liter per hour
mg/cm^2-day: milligram per square centimeter per day
mg/day: milligram per day

Attachment 4
Table 2. Surface Water and Sediment Screening Levels
Iowa Army Ammunition Plant, Middletown, Iowa

		Adult Hunter/Recreator SLs (THQ=0.1)				Adolescent Hunter/Recreator SLs				Final SLs (THQ=0.1)			
Chemical	CASNumber	Sediment (mg/kg)		Surface Water - Swimming (ug/L)		Sediment (mg/kg)		Surface Water - Swimming (ug/L)		Sediment (mg/kg)		Surface Water - Swimming (ug/L)	
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	33700000	nc	2050000	nc	18700000	nc	1140000	nc	18700000	nc	1140000	nc
Dichloroethylene, 1,1-	75-35-4	56200	nc	7010	nc	31100	nc	3880	nc	31100	nc	3880	nc
Aluminum	7429-90-5	1120000	nc	503000	nc	622000	nc	279000	nc	622000	nc	279000	nc
Arsenic, Inorganic	7440-38-2	36.1	c	11.7	c	49.9	c	16.2	c	36.1	c	11.7	c
Barium	7440-39-3	225000	nc	30100	nc	124000	nc	16700	nc	124000	nc	16700	nc
Beryllium and compounds	7440-41-7	2250	nc	38.7	nc	1240	nc	21.4	nc	1240	nc	21.4	nc
Cadmium (Diet)	7440-43-9	96.1	nc	11.6	nc	53.2	nc	6.41	nc	53.2	nc	6.41	nc
Chromium(VI)	18540-29-9	78.6	c	2.36	c	36.3	c	1.09	c	36.3	c	1.09	c
Cobalt	7440-48-4	337	nc	169	nc	187	nc	93.4	nc	187	nc	93.4	nc
Copper	7440-50-8	44900	nc	20100	nc	24900	nc	11100	nc	24900	nc	11100	nc
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	54800	nc	29300	nc	30300	nc	16300	nc	30300	nc	16300	nc
Iron	7439-89-6	786000	nc	352000	nc	435000	nc	195000	nc	435000	nc	195000	nc
Lead	7439-92-1	NA		NA		NA		NA		NA		NA	
Manganese (Non-diet)	7439-96-5	27000	nc	2310	nc	14900	nc	1280	nc	14900	nc	1280	nc
Molybdenum	7439-98-7	5620	nc	2510	nc	3110	nc	1390	nc	3110	nc	1390	nc
Nickel Soluble Salts	7440-02-0	22500	nc	5900	nc	12400	nc	3270	nc	12400	nc	3270	nc
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	462	c	224	c	640	c	311	c	462	c	224	c
Selenium	7782-49-2	5620	nc	2510	nc	3110	nc	1390	nc	3110	nc	1390	nc
Silver	7440-22-4	5620	nc	726	nc	3110	nc	402	nc	3110	nc	402	nc
Vanadium and Compounds	7440-62-2	5660	nc	334	nc	3130	nc	185	nc	3130	nc	185	nc
Zinc and Compounds	7440-66-6	337000	nc	162000	nc	187000	nc	89900	nc	187000	nc	89900	nc

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Soil	Soil	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion, Inhalation	On-site	None	The East Burn Pads is open to recreational use; therefore, hunting is permitted at the site. However, soil is addressed under OU1 with land use controls for industrial land use.
	Surface Water/Sediment	Surface Water/Sediment	Drainage Ditches	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion	On-site	None	The East Burn Pads is open to recreational use; therefore, hunting is permitted at the site. However, the waterbodies within the East Burn Pads are intermittent in nature, thus surface water and sediment were not evaluated in the HHRA. Exposures to Spring Creek surface water and sediment are addressed with the West Burn Pads HHRA.
Future	Soil	Soil	Soil	Site Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	Soil is addressed under OU1 with land use controls for industrial land use.
				Construction/ Utility Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	
				Hypothetical Resident	Adult, Child	Dermal, Ingestion, Inhalation	On-site	None	
	Groundwater(1)	Tapwater	Tapwater	Site Worker	Adult	Dermal, Ingestion	On-site	Quant (2)	Future site workers could use groundwater as a potable water source. Site workers could ingest drinking water and could have dermal contact with groundwater while hand washing.
				Hypothetical Resident	Adult, Child	Dermal, Ingestion	On-site	Quant	Future hypothetical residents could use groundwater as a potable water source. Residents could ingest drinking water and could have dermal contact with groundwater while showering.
		Household Air (Domestic Use)	Vapors in House (Domestic Use)	Hypothetical Resident	Adult, Child	Inhalation	On-site	Quant	Future hypothetical residents could be exposed to vapors in household air via inhalation.
		Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Hypothetical Resident	Adult, Child	Inhalation	On-Site	Quant	Future hypothetical residents could inhale volatile groundwater constituents in indoor air from vapor intrusion.
				Site Worker	Adult	Inhalation	On-site	Quant (2)	Site workers could inhale volatile groundwater constituents in indoor air from vapor intrusion.
	Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Construction/ Utility Worker	Adult	Dermal, Ingestion	On-site	Quant (2)	Construction/utility workers could incidentally ingest and have dermal contact with shallow groundwater in a trench while replacing the culverts within the East Burn Pads.
		Trench Air	Vapors in a Trench	Construction/ Utility Worker	Adult	Inhalation	On-site	Quant (2)	Construction/utility workers could inhale volatile groundwater constituents in trench air while replacing culverts within the East Burn Pads.

Notes:
Quant: Quantitative evaluation

(1) Groundwater is not currently being used as a potable water source and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the East Burn Pads is classified as Class IIB, a potential source of drinking water. Therefore, the HHRA evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This requires the evaluation of future residential exposures to groundwater.

(2) Potential exposures to groundwater were not estimated for a site worker and construction worker because the estimated risks for a hypothetical residential scenario did not exceed acceptable risk levels and COCs were not identified for a residential scenario. The hypothetical resident exposures and potential health risks and hazards are considered protective of other receptors.

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater/Household Air (Domestic Use)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
Tapwater/	99-35-4	1,3,5-Trinitrobenzene	2.4E-01	J	2.4E-01	J	µg/L	EBP-MW13	1 / 22	0.1 - 0.86	2.4E-01	NA	5.9E+01	nc	NA	NA	No	BSL
Vapors in House	19406-51-0	4-Amino-2,6-dinitrotoluene	3.2E-01		3.2E-01		µg/L	EBP-MW13	1 / 22	0.1 - 0.86	3.2E-01	NA	1.9E-01	nc	NA	NA	Yes	ASL
(Domestic Use)	DNX	DNX	4.6E-01	J	5.4E-01		µg/L	EDA-2	2 / 16	0.096 - 0.28	5.4E-01	NA	NTX		NA	NA	No	BSL
East Burn Pads	2691-41-0	HMX	1.4E+00		7.3E+01		µg/L	EDA-4	6 / 22	0.2 - 20	7.3E+01	NA	1.0E+02	nc	4.0E+02	LHA	No	BSL
	5755-27-1	MNX	1.4E-01	J	1.0E+00		µg/L	MW4	5 / 22	0.055 - 1	1.0E+00	NA	NTX		NA	NA	No	BSL
	121-82-4	RDX	3.1E-01		4.7E+01		µg/L	EBP-MW4	8 / 23	0.1 - 1	4.7E+01	NA	9.7E-01	ca	2.0E+00	LHA	Yes	ASL
	7429-90-5	Aluminum	1.9E+02	B	1.9E+02	B	µg/L	EBP-MW6	1 / 1	-	1.9E+02	1.1E+04	2.0E+03	nc	NA	NA	No	BSL
	7440-38-2	Arsenic	2.5E+00	J	2.8E+01		µg/L	EBP-MW2	10 / 22	2.8 - 10	2.8E+01	3.3E+01	5.2E-02	ca	1.0E+01	MCL	Yes	ASL
	7440-39-3	Barium	4.5E+01	J	6.1E+02		µg/L	EBP-MW2	14 / 14	-	6.1E+02	4.3E+02	3.8E+02	nc	2.0E+03	MCL	Yes	ASL
	7440-43-9	Cadmium	3.6E-01	B	3.6E-01	B	µg/L	EBP-MW6	1 / 14	5 - 5	3.6E-01	5.0E+00	1.8E-01	nc	5.0E+00	MCL	Yes	ASL
	7440-70-2	Calcium	6.2E+04		7.9E+04		µg/L	EBP-MW5	4 / 4	-	7.9E+04	1.2E+05	NUT		NA	NA	No	NUT
	7440-47-3	Chromium	7.6E-01	J	1.5E+01		µg/L	EBP-MW2	4 / 14	10 - 10	1.5E+01	3.1E+01	3.5E-02	ca	1.0E+02	MCL	Yes	ASL
	7440-48-4	Cobalt	3.8E+00	B	3.8E+00	B	µg/L	EBP-MW6	1 / 1	-	3.8E+00	NA	6.0E-01	nc	NA	NA	Yes	ASL
	7440-50-8	Copper	4.1E+00	B	4.1E+00	B	µg/L	EBP-MW6	1 / 1	-	4.1E+00	1.6E+01	8.0E+01	nc	1.3E+03	MCL	No	BSL
	7439-89-6	Iron	4.2E+02		4.2E+02		µg/L	EBP-MW6	1 / 1	-	4.2E+02	9.7E+03	1.4E+03	nc	NA	NA	No	BSL
	7439-95-4	Magnesium	2.2E+04		4.8E+04		µg/L	EBP-MW6	4 / 4	-	4.8E+04	4.5E+04	NUT		NA	NA	No	NUT
	7439-96-5	Manganese	8.5E+01		8.5E+01		µg/L	EBP-MW6	1 / 1	-	8.5E+01	5.8E+02	4.3E+01	nc	3.0E+02	LHA	Yes	ASL
	7439-97-6	Mercury	2.0E-02	J	1.7E-01		µg/L	EDA-3	3 / 14	0.1 - 0.2	1.7E-01	1.0E+00	5.7E-01	nc	2.0E+00	MCL	No	BSL
	7440-02-0	Nickel	2.0E+01	B	2.0E+01	B	µg/L	EBP-MW6	1 / 1	-	2.0E+01	5.1E+01	3.9E+01	nc	1.0E+02	LHA	No	BSL
	7440-09-7	Potassium	4.9E+03	B	4.9E+03	B	µg/L	EBP-MW6	1 / 1	-	4.9E+03	2.5E+03	NUT		NA	NA	No	NUT
	7782-49-2	Selenium	3.0E+00	J	9.5E+00	J	µg/L	JAW-04	4 / 14	2.8 - 10	9.5E+00	1.0E+01	1.0E+01	nc	5.0E+01	MCL	No	BSL
	7440-23-5	Sodium	9.2E+03		3.3E+04		µg/L	EBP-MW6	4 / 4	-	3.3E+04	4.3E+04	NUT		NA	NA	No	NUT
	7440-62-2	Vanadium	1.2E+00	B	1.2E+00	B	µg/L	EBP-MW6	1 / 1	-	1.2E+00	1.5E+01	8.6E+00	nc	NA	NA	No	BSL
	7440-66-6	Zinc	9.8E+00	B	9.8E+00	B	µg/L	EBP-MW6	1 / 1	-	9.8E+00	7.9E+02	6.0E+02	nc	2.0E+03	LHA	No	BSL
	117-81-7	bis (2-ethylhexyl) phthalate	1.0E+00	J	2.0E+00		µg/L	EBP-MW4	2 / 17	5 - 5	2.0E+00	NA	5.6E+00	ca	6.0E+00	MCL	No	BSL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.0E+00		2.0E+00	J	µg/L	2, JAW-64	5 / 20	0.4 - 3	2.0E+00	NA	1.0E+03	nc	NA	NA	No	BSL
	67-64-1	Acetone	2.7E+00	J	2.7E+00	J	µg/L	EBP-MW13	1 / 20	1.9 - 25	2.7E+00	NA	1.8E+03	nc	NA	NA	No	BSL
	74-82-8	Methane	3.7E+00		7.8E+00		µg/L	EBP-MW6	2 / 6	0.5 - 0.5	7.8E+00	NA	NTX		NA	NA	No	BSL
	108-88-3	Toluene	2.0E+00	J	2.0E+00	J	µg/L	EBP-MW2	1 / 20	0.4 - 3	2.0E+00	NA	1.1E+02	nc	1.0E+03	MCL	No	BSL
	79-01-6	Trichloroethene	2.0E+00		3.0E+00	J	µg/L	JAW-06	2 / 20	0.4 - 3	3.0E+00	NA	2.8E-01	nc	5.0E+00	MCL	Yes	ASL
	95-47-6	Xylene, o-	1.0E+00		1.0E+00		µg/L	EBP-MW5	1 / 18	0.4 - 3	1.0E+00	NA	1.9E+01	nc	NA	NA	No	BSL
	1330-20-7	Xylenes, total	1.0E+00		1.0E+00		µg/L	EBP-MW5	1 / 19	3 - 3	1.0E+00	NA	1.9E+01	nc	1.0E+04	MCL	No	BSL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Regional Screening Levels (RSL) for Tap Water (May, 2023). Concentrations based on non-carcinogenic health effects are based on HQ=0.1.
The RSL for hexavalent chromium was used for total chromium.
The RSL for mercuric chloride (and other mercury salts) was used for mercury.

(4) Values are the Federal Maximum Contaminant Levels (MCLs) and if no MCL was available, the EPA's (March 2018) Office of Water Lifetime Health Advisory (LHA) was provided.

(5) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
No Toxicity Information (NTX)
Essential Nutrient (NUT)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
B = Inorganic, metals results detected below the RL. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
ca = carcinogenic
COPC = Chemical of Potential Concern
DNX = 1,3-dinitroso-5-nitro-1,3,5-triazacyclohexane
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
nc = noncarcinogenic
RDX = Royal Demolition Explosive
µg/L= microgram per liter

TABLE 2.2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Indoor Air	99-35-4	1,3,5-Trinitrobenzene	2.4E-01	J	2.4E-01	J	µg/L	EBP-MW13	1 / 22	0.1 - 0.86	2.4E-01	NA	NSV		NA	NA	No	NSV
(Vapor Intrusion)	19406-51-0	4-Amino-2,6-dinitrotoluene	3.2E-01		3.2E-01		µg/L	EBP-MW13	1 / 22	0.1 - 0.86	3.2E-01	NA	NSV		NA	NA	No	NSV
East Burn Pads	DNX	DNX	4.6E-01	J	5.4E-01		µg/L	EDA-2	2 / 16	0.096 - 0.28	5.4E-01	NA	NTX		NA	NA	No	NTX
	2691-41-0	HMX	1.4E+00		7.3E+01		µg/L	EDA-4	6 / 22	0.2 - 20	7.3E+01	NA	NSV		NA	NA	No	NSV
	5755-27-1	MNX	1.4E-01	J	1.0E+00		µg/L	MW4	5 / 22	0.055 - 1	1.0E+00	NA	NTX		NA	NA	No	NTX
	121-82-4	RDX	3.1E-01		4.7E+01		µg/L	EBP-MW4	8 / 23	0.1 - 1	4.7E+01	NA	NSV		NA	NA	No	NSV
	7429-90-5	Aluminum	1.9E+02	B	1.9E+02	B	µg/L	EBP-MW6	1 / 1	-	1.9E+02	1.1E+04	NSV		NA	NA	No	NSV
	7440-38-2	Arsenic	2.5E+00	J	2.8E+01		µg/L	EBP-MW2	10 / 22	2.8 - 10	2.8E+01	3.3E+01	NSV		NA	NA	No	NSV
	7440-39-3	Barium	4.5E+01	J	6.1E+02		µg/L	EBP-MW2	14 / 14	-	6.1E+02	4.3E+02	NSV		NA	NA	No	NSV
	7440-43-9	Cadmium	3.6E-01	B	3.6E-01	B	µg/L	EBP-MW6	1 / 14	5 - 5	3.6E-01	5.0E+00	NSV		NA	NA	No	NSV
	7440-70-2	Calcium	6.2E+04		7.9E+04		µg/L	EBP-MW5	4 / 4	-	7.9E+04	1.2E+05	NUT		NA	NA	No	NUT
	7440-47-3	Chromium	7.6E-01	J	1.5E+01		µg/L	EBP-MW2	4 / 14	10 - 10	1.5E+01	3.1E+01	NSV		NA	NA	No	NSV
	7440-48-4	Cobalt	3.8E+00	B	3.8E+00	B	µg/L	EBP-MW6	1 / 1	-	3.8E+00	NA	NSV		NA	NA	No	NSV
	7440-50-8	Copper	4.1E+00	B	4.1E+00	B	µg/L	EBP-MW6	1 / 1	-	4.1E+00	1.6E+01	NSV		NA	NA	No	NSV
	7439-89-6	Iron	4.2E+02		4.2E+02		µg/L	EBP-MW6	1 / 1	-	4.2E+02	9.7E+03	NSV		NA	NA	No	NSV
	7439-95-4	Magnesium	2.2E+04		4.8E+04		µg/L	EBP-MW6	4 / 4	-	4.8E+04	4.5E+04	NUT		NA	NA	No	NUT
	7439-96-5	Manganese	8.5E+01		8.5E+01		µg/L	EBP-MW6	1 / 1	-	8.5E+01	5.8E+02	NSV		NA	NA	No	NSV
	7439-97-6	Mercury	2.0E-02	J	1.7E-01		µg/L	EDA-3	3 / 14	0.1 - 0.2	1.7E-01	1.0E+00	NSV		NA	NA	No	NSV
	7440-02-0	Nickel	2.0E+01	B	2.0E+01	B	µg/L	EBP-MW6	1 / 1	-	2.0E+01	5.1E+01	NSV		NA	NA	No	NSV
	7440-09-7	Potassium	4.9E+03	B	4.9E+03	B	µg/L	EBP-MW6	1 / 1	-	4.9E+03	2.5E+03	NUT		NA	NA	No	NUT
	7782-49-2	Selenium	3.0E+00	J	9.5E+00	J	µg/L	JAW-04	4 / 14	2.8 - 10	9.5E+00	1.0E+01	NSV		NA	NA	No	NSV
	7440-23-5	Sodium	9.2E+03		3.3E+04		µg/L	EBP-MW6	4 / 4	-	3.3E+04	4.3E+04	NUT		NA	NA	No	NUT
	7440-62-2	Vanadium	1.2E+00	B	1.2E+00	B	µg/L	EBP-MW6	1 / 1	-	1.2E+00	1.5E+01	NSV		NA	NA	No	NSV
	7440-66-6	Zinc	9.8E+00	B	9.8E+00	B	µg/L	EBP-MW6	1 / 1	-	9.8E+00	7.9E+02	NSV		NA	NA	No	NSV
	117-81-7	bis (2-ethylhexyl) phthalate	1.0E+00	J	2.0E+00		µg/L	EBP-MW4	2 / 17	5 - 5	2.0E+00	NA	NSV		NA	NA	No	NSV
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.0E+00		2.0E+00	J	µg/L	2, JAW-64	5 / 20	0.4 - 3	2.0E+00	NA	3.8E+01	NC	NA	NA	No	BSL
	67-64-1	Acetone	2.7E+00	J	2.7E+00	J	µg/L	EBP-MW13	1 / 20	1.9 - 25	2.7E+00	NA	NTX		NA	NA	No	NTX
	74-82-8	Methane	3.7E+00		7.8E+00		µg/L	EBP-MW6	2 / 6	0.5 - 0.5	7.8E+00	NA	NTX		NA	NA	No	NTX
	108-88-3	Toluene	2.0E+00	J	2.0E+00	J	µg/L	EBP-MW2	1 / 20	0.4 - 3	2.0E+00	NA	3.5E+03	NC	NA	NA	No	BSL
	79-01-6	Trichloroethene	2.0E+00		3.0E+00	J	µg/L	JAW-06	2 / 20	0.4 - 3	3.0E+00	NA	9.0E-01	NC	NA	NA	Yes	ASL
	95-47-6	Xylene, o-	1.0E+00		1.0E+00		µg/L	EBP-MW5	1 / 18	0.4 - 3	1.0E+00	NA	9.9E+01	NC	NA	NA	No	BSL
	1330-20-7	Xylenes, total	1.0E+00		1.0E+00		µg/L	EBP-MW5	1 / 19	3 - 3	1.0E+00	NA	7.6E+01	NC	NA	NA	No	BSL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Residential Groundwater Vapor Intrusion Screening Level (May 2023). Concentration based on site specific groundwater temperature of 13°C and non-carcinogenic health effects are based on HQ=0.1.

(4) Rationale Codes:

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: Below Screening Level (BSL)

Not Sufficiently Volatile (NSV)

No Toxicity Information (NTX)

Essential Nutrient (NUT)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

B = Inorganic, metals results detected below the RL. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

COPC = Chemical of Potential Concern

DNX = 1,3-dinitroso-5-nitro-1,3,5-triazacyclohexane

HQ = hazard quotient

HMX = Hot Melt Explosive

J = compound was detected below the reporting limit in the sample

MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane

NA = not available

nc = noncarcinogenic

RDX = Royal Demolition Explosive

µg/L= microgram per liter

TABLE 3.1.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident)
Medium: Groundwater (RDX Plume)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale
Tapwater East Burn Pads RDX Plume	4-Amino-2,6-dinitrotoluene	µg/L	3.2E-01	NA	3.2E-01	3.2E-01	µg/L	Sitewide Max	1
	RDX	µg/L	1.7E+01	NA	4.7E+01	4.7E+01	µg/L	Plume Max	1
	Arsenic	µg/L	1.3E+01	NA	2.8E+01	2.8E+01	µg/L	Sitewide Max	1
	Barium	µg/L	1.3E+02	NA	6.1E+02	6.1E+02	µg/L	Sitewide Max	1
	Cadmium	µg/L	3.6E-01	NA	3.6E-01	3.6E-01	µg/L	Plume Max	1
	Chromium	µg/L	6.0E+00	NA	1.5E+01	1.5E+01	µg/L	Sitewide Max	1
	Cobalt	µg/L	3.8E+00	NA	3.8E+00 B	3.8E+00	µg/L	Plume Max	1
	Manganese	µg/L	8.5E+01	NA	8.5E+01	8.5E+01	µg/L	Plume Max	1
	Trichloroethene	µg/L	2.5E+00	NA	3.0E+00 J	3.0E+00	µg/L	Sitewide Max	1

Notes:
** Groundwater EPCs were calculated using monitoring wells located within the core of the RDX plume: EBP-MW3, EBP-MW4, EBP-MW5, EBP-MW6, EBP-MW7, EDA-2, and JAW-614. The maximum detected concentrations for 4-amino-2,6-dinitrotoluene, arsenic, barium, chromium, and trichloroethene were outside the core of the RDX plume; therefore, the EPCs for these constituents were the maximum detected concentrations based on the sitewide groundwater dataset.

Statistics: Max - Maximum Detected Value

* Arithmetic mean of detected concentrations are presented.

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples from the plume.

µg/L = microgram per liter
B = Inorganic, metals results detected below the RL. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
EPC = Exposure Point Concentration
J = compound was detected below the reporting limit in the sample
NA = Not Available
RME = Reasonable Maximum Exposure
UCL = Upper Confidence Limit

TABLE 3.2.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Indoor Air (Vapor Intrusion)	Trichloroethene	µg/L	2.5E+00	NA	3.0E+00 J	3.0E+00	µg/L	Sitewide Max	1

Notes:
Statistics: Max - Maximum Detected Value

* Arithmetic mean of detected concentrations are presented.

(1) The maximum detected concentration was used as the EPC to evaluate the vapor intrusion pathway.

EPC = Exposure Point Concentration
J = result is estimated
NA = not applicable
UCL = Upper Confidence Limit
µg/L = microgram per liter

TABLE 3.2.RME SUPPLEMENT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	Chemical of Potential Concern (1)	Exposure Point Concentration in Groundwater		Exposure Point Concentration in Indoor Air	
		Value (2)	Units	Value (3)	Units
Indoor Air (Vapor Intrusion)	Trichloroethene	3.0E+00	µg/L	7.0E-01	$\mu g/m^3$

Notes:
(1) Chemicals of Potential Concern from Table 2.2.RME.
(2) Selection of exposure point concentration from Table 3.2.RME.
(3) The indoor air concentrations for groundwater-to-indoor air were estimated using the EPA's VISL Calculator, May 2023 (EPA, 2023).
Site-specific groundwater temperature of 13 degrees C used to estimate indoor air concentrations.

µg/L = microgram per liter
$\mu g/m^3$ = microgram per cubic meter

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	2.5	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	0.78	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				BW	Body Weight	15	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W-Adj	Ingestion Rate of Water, Age-adjusted	0.94	liter-year/kg-day	Calculated	CW x IR-W-Adj x EF x CF1 x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	IR-W-Adj (liter-year/kd-day) =
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	(ED-C x IR-W-C / BW-C) + (ED-A x IR-W-A / BW-A)
Dermal	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	19,652	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.71	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	80	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,365	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.54	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) = DA-Adj x EF x EV x 1/AT
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	Calculated	mg-year/event-kg	Calculated	DA-Adj = (DAevent-A x SA-A x ED-A x 1/BW-A)
				EV	Event Frequency	1	events/day	EPA, 2004	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

Notes:

(1) Calculated as the product of ED (years) x 365 days/year.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

cm/hr = Centimeter per hour
cm^2 = Square centimeter
mg/µg = Milligram per microgram
kg = Kilogram
L/cm^3 = Liter per cubic centimeter
L/day = Liter per day
mg/cm^2 -event = Milligram per square centimeter per event
mg/kg-day = Milligram per kilogram per day
µg/L = Microgram per liter

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Household Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Hypothetical Resident	Adult	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	Exposure Concentration (EC) (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	
		Child	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	EC (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	
		Child/Adult Aggregate	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	EC (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	

Notes:

(1) Calculated as the product of ED (years) x 365 days/year.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 1991. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals). Office of Emergency and Remedial Response. EPA/540/R-92/003. December 1991.

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

mg/m^3 = Milligram per cubic meter

L/m^3 = Liter per cubic meter

µg/L = Microgram per liter

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Hypothetical Resident	Adult	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Indoor Air	See Table 3.2.RME Supp	µg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	20	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
		Child	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	See Table 3.2.RME Supp	µg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	6	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
		Child/Adult Aggregate	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	See Table 3.2.RME Supp	µg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration, Resident	26	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

Notes:

(1) Calculated as the product of ED (years) x 365 days/year.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA, 2023: Vapor Intrusion Screening Levels (VISL) Calculator tool. May.

µg/L = microgram per liter

µg/m^3 = microgram per cubic meter

hr/day = hour per day

mg/m^3 = milligram per cubic meter

TABLE 4 RME SUPPLEMENT
RECEPTOR-SPECIFIC EXPOSURE FACTORS FOR HYPOTHETICAL RESIDENT
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor: Hypothetical Resident

					Water	
Age Group	**Age-dependent Adjustment Factor (ADAF)**	**Exposure Frequency (EF)**	**Exposure Duration (ED)**	**Body Weight (BW)**	**Ingestion**	**IR-W-Adj**
		(day/year)	**(years)**	**(kg)**	**(L/day)**	**(L/kg)**
Child (0-2)	10	350	2	15	0.78	364
Child (2-6)	3	350	4	15	0.78	218
Adolescent (6-16)	3	350	10	80	2.5	328
Adult (16-26)	1	350	10	80	2.5	109
Total			26			1,020

Equations
Ingestion (water): Total IR-W-Adj (MMOA) [L/kg} = Sum (ADAF x EF x ED x IR-S x 1/BW)

Sources:
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-18/259F, 2019.

MMOA - Mutagenic mode of action
ADAF - Age-dependent Adjustment Factor
kg = Kilogram
L/day = Liter per day

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
4-Amino-2,6-dinitrotoluene	Chronic	1.0E-04	mg/kg-day	100%	1.0E-04	mg/kg-day	Hepatic	3000	PPRTV X	06/05/2020
Arsenic	Chronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Cardiovascular, Dermal	3	IRIS	09/18/2023
Barium	Chronic	2.0E-01	mg/kg-day	7%	1.4E-02	mg/kg-day	Urinary	300	IRIS	09/18/2023
Cadmium (water)	Chronic	1.0E-04	mg/kg-day	5%	5.0E-06	mg/kg-day	Urinary	3	ATSDR	09/2012
Chromium (hexavalent)	Chronic	3.0E-03	mg/kg-day	2.5%	7.5E-05	mg/kg-day	NOE	300/3	IRIS	09/18/2023
Cobalt	Chronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Thyroid	3000	PPRTV	08/25/2008
Manganese (diet)	Chronic	1.4E-01	mg/kg-day	4%	5.6E-03	mg/kg-day	Nervous	1	IRIS	09/18/2023
Manganese (non-diet) (3)	Chronic	2.4E-02	mg/kg-day	4%	9.6E-04	mg/kg-day	Nervous	1	IRIS	09/18/2023
RDX	Chronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Nervous	300	IRIS	09/18/2023
Trichloroethene	Chronic	5.0E-04	mg/kg-day	100%	5.0E-04	mg/kg-day	Developmental, Cardiovascular, Immune	10 - 1000	IRIS	09/18/2023

Note:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) The RfD (0.14 mg/kg-day) presented in IRIS includes manganese from all sources, including diet. This RfD was adjusted by subtracting the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) and applying a modifying factor of 3 to address uncertainties associated with non-food manganese exposure sources.

Definitions:
IRIS = Integrated Risk Information System
NA = Not Available
NOE = No Observed Effect
PPRTV = Provisional Peer-Reviewed Toxicity Value
PPRTV X = PPRTV appendix screening toxicity values

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Trichloroethene	Chronic	2.0E-03	mg/m^3	Developmental, Cardiovascular, Immune	10-100	IRIS	09/18/2023

Definitions:

IRIS = Integrated Risk Information System

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	$(mg/kg\text{-}day)^{-1}$	95%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	09/18/2023
Barium	NA	NA	NA	NA	NA	D	IRIS	09/18/2023
Cadmium	NA	NA	NA	NA	NA	B1	IRIS	09/18/2023
Chromium (hexavalent) (3)	5.0E-01	$(mg/kg\text{-}day)^{-1}$	2.5%	2.0E+01	$(mg/kg\text{-}day)^{-1}$	Cannot determine (oral)	Cal EPA	09/18/2023
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	D	IRIS	09/18/2023
RDX	8.0E-02	$(mg/kg\text{-}day)^{-1}$	100%	8.0E-02	$(mg/kg\text{-}day)^{-1}$	Suggestive evidence of carcinogenic potential	IRIS	09/18/2023
Trichloroethene (3)	4.6E-02	$(mg/kg\text{-}day)^{-1}$	100%	4.6E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (Kidney) (3)	9.3E-03	$(mg/kg\text{-}day)^{-1}$	100%	9.3E-03	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (NHL + Liver)	3.7E-02	$(mg/kg\text{-}day)^{-1}$	100%	3.7E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral slope factor should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) This chemical operates with a mutagenic mode of action (EPA, 2005) and would exhibit a greater effect in early-life versus later-life exposure. Chemical-specific toxicity data are not available for childhood and early-life exposures; thus, EPA (2005) default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<26	1

Definitions:
Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
NA = Not Available

Weight of Evidence definitions (EPA, 1986):

Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.

Group B1 chemicals (probable human carcinogens) are agents for which there is limited evidence of possible carcinogenicity in humans.

Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.

Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Trichloroethene (1)	4.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (kidney) (1)	1.0E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (NHL + Liver)	3.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023

Note:

(1) This chemical operates with a mutagenic mode of action (EPA, 2005) and would exhibit a greater effect in early-life versus later-life exposure. Chemical-specific toxicity data are not available for childhood and early-life exposures; 2005) thus, EPA (default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<26	1

Definitions:

IRIS = Integrated Risk Information System

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	7.0E-01	µg/m^3	NA	NA	NA	NA	NA	6.7E-04	mg/m^3	2.0E-03	mg/m3	3.3E-01
			Exp. Route Total								NA					3.3E-01
		Exposure Point Total									NA					3.3E-01
	Exposure Medium Total										NA					3.3E-01
	Tapwater	Tapwater	Ingestion	4-Amino-2,6-dinitrotoluene	3.2E-01	µg/L	NA	NA	NA	NA	NA	9.6E-06	mg/kg/day	1.0E-04	mg/kg/day	9.6E-02
				RDX	4.7E+01	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	4.0E-03	mg/kg/day	3.5E-01
				Arsenic	2.8E+01	µg/L	NA	NA	NA	NA	NA	8.4E-04	mg/kg/day	3.0E-04	mg/kg/day	2.8E+00
				Barium	6.1E+02	µg/L	NA	NA	NA	NA	NA	1.8E-02	mg/kg/day	2.0E-01	mg/kg/day	9.2E-02
				Chromium	1.5E+01	µg/L	NA	NA	NA	NA	NA	4.5E-04	mg/kg/day	3.0E-03	mg/kg/day	1.5E-01
				Cobalt	3.8E+00	µg/L	NA	NA	NA	NA	NA	1.1E-04	mg/kg/day	3.0E-04	mg/kg/day	3.8E-01
				Manganese	8.5E+01	µg/L	NA	NA	NA	NA	NA	2.5E-03	mg/kg/day	2.4E-02	mg/kg/day	1.1E-01
				Trichloroethene	3.0E+00	µg/L	NA	NA	NA	NA	NA	9.0E-05	mg/kg/day	5.0E-04	mg/kg/day	1.8E-01
			Exp. Route Total								NA					4.2E+00

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	4-Amino-2,6-dinitrotoluene	3.2E-01	µg/L	NA	NA	NA	NA	NA	4.1E-07	mg/kg/day	1.0E-04	mg/kg/day	4.1E-03
				RDX	4.7E+01	µg/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	4.0E-03	mg/kg/day	2.9E-03
				Arsenic	2.8E+01	µg/L	NA	NA	NA	NA	NA	4.7E-06	mg/kg/day	3.0E-04	mg/kg/day	1.6E-02
				Barium	6.1E+02	µg/L	NA	NA	NA	NA	NA	1.0E-04	mg/kg/day	1.4E-02	mg/kg/day	7.3E-03
				Chromium	1.5E+01	µg/L	NA	NA	NA	NA	NA	5.0E-06	mg/kg/day	7.5E-05	mg/kg/day	6.6E-02
				Cobalt	3.8E+00	µg/L	NA	NA	NA	NA	NA	2.5E-07	mg/kg/day	3.0E-04	mg/kg/day	8.5E-04
				Manganese	8.5E+01	µg/L	NA	NA	NA	NA	NA	1.4E-05	mg/kg/day	9.6E-04	mg/kg/day	1.5E-02
				Trichloroethene	3.0E+00	µg/L	NA	NA	NA	NA	NA	1.4E-05	mg/kg/day	5.0E-04	mg/kg/day	2.9E-02
			Exp. Route Total								NA					1.4E-01
		Exposure Point Total									NA					4.3E+00
	Exposure Medium Total										NA					4.3E+00
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	3.0E+00	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/m^3	2.0E-03	mg/m3	7.2E-01
			Exp. Route Total								NA					7.2E-01
		Exposure Point Total									NA					7.2E-01
	Exposure Medium Total										NA					7.2E-01
Groundwater Total											NA					5.3E+00
Receptor Total											NA					5E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.1.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
4-Amino-2,6-dinitrotoluene	3.2E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	1.8E-09	2
RDX	4.7E+01	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.71	5.0E-08	2
Arsenic	2.8E+01	1.0E-03	NA	NA	NA	NA	0.71	2.0E-08	1
Barium	6.1E+02	1.0E-03	NA	NA	NA	NA	0.71	4.3E-07	1
Chromium	1.5E+01	2.0E-03	NA	NA	NA	NA	0.71	2.1E-08	1
Cobalt	3.8E+00	4.0E-04	NA	NA	NA	NA	0.71	1.1E-09	1
Manganese	8.5E+01	1.0E-03	NA	NA	NA	NA	0.71	6.0E-08	1
Trichloroethene	3.0E+00	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.71	6.1E-08	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	7.0E-01	µg/m^3	NA	NA	NA	NA	NA	6.7E-04	mg/m^3	2.0E-03	mg/m3	3.3E-01
			Exp. Route Total								NA					3.3E-01
		Exposure Point Total									NA					3.3E-01
	Exposure Medium Total										NA					3.3E-01
	Tapwater	Tapwater	Ingestion	4-Amino-2,6-dinitrotoluene	3.2E-01	µg/L	NA	NA	NA	NA	NA	1.6E-05	mg/kg/day	1.0E-04	mg/kg/day	1.6E-01
				RDX	4.7E+01	µg/L	NA	NA	NA	NA	NA	2.3E-03	mg/kg/day	4.0E-03	mg/kg/day	5.9E-01
				Arsenic	2.8E+01	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	3.0E-04	mg/kg/day	4.7E+00
				Barium	6.1E+02	µg/L	NA	NA	NA	NA	NA	3.1E-02	mg/kg/day	2.0E-01	mg/kg/day	1.5E-01
				Chromium	1.5E+01	µg/L	NA	NA	NA	NA	NA	7.4E-04	mg/kg/day	3.0E-03	mg/kg/day	2.5E-01
				Cobalt	3.8E+00	µg/L	NA	NA	NA	NA	NA	1.9E-04	mg/kg/day	3.0E-04	mg/kg/day	6.3E-01
				Manganese	8.5E+01	µg/L	NA	NA	NA	NA	NA	4.2E-03	mg/kg/day	2.4E-02	mg/kg/day	1.8E-01
				Trichloroethene	3.0E+00	µg/L	NA	NA	NA	NA	NA	1.5E-04	mg/kg/day	5.0E-04	mg/kg/day	3.0E-01
			Exp. Route Total								NA					6.9E+00

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	4-Amino-2,6-dinitrotoluene	3.20E-01	µg/L	NA	NA	NA	NA	NA	6.2E-07	mg/kg/day	1.0E-04	mg/kg/day	6.2E-03
				RDX	4.70E+01	µg/L	NA	NA	NA	NA	NA	1.8E-05	mg/kg/day	4.0E-03	mg/kg/day	4.4E-03
				Arsenic	2.80E+01	µg/L	NA	NA	NA	NA	NA	6.2E-06	mg/kg/day	3.0E-04	mg/kg/day	2.1E-02
				Barium	6.12E+02	µg/L	NA	NA	NA	NA	NA	1.3E-04	mg/kg/day	1.4E-02	mg/kg/day	9.6E-03
				Chromium	1.49E+01	µg/L	NA	NA	NA	NA	NA	6.5E-06	mg/kg/day	7.5E-05	mg/kg/day	8.7E-02
				Cobalt	3.80E+00	µg/L	NA	NA	NA	NA	NA	3.3E-07	mg/kg/day	3.0E-04	mg/kg/day	1.1E-03
				Manganese	8.49E+01	µg/L	NA	NA	NA	NA	NA	1.9E-05	mg/kg/day	9.6E-04	mg/kg/day	1.9E-02
				Trichloroethene	3.00E+00	µg/L	NA	NA	NA	NA	NA	2.2E-05	mg/kg/day	5.0E-04	mg/kg/day	4.4E-02
			Exp. Route Total								NA					1.9E-01
		Exposure Point Total									NA					7.1E+00
	Exposure Medium Total										NA					7.1E+00
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	3.0E+00	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/m^3	2.0E-03	mg/m3	7.2E-01
			Exp. Route Total								NA					7.2E-01
		Exposure Point Total									NA					7.2E-01
	Exposure Medium Total										NA					7.2E-01
Groundwater Total											NA					8.2E+00
Receptor Total											NA					8E+00

Notes:

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

µg/L = microgram per liter

µg/m^3= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 7.2.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
4-Amino-2,6-dinitrotoluene	3.2E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	1.5E-09	2
RDX	4.7E+01	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.54	4.4E-08	2
Arsenic	2.8E+01	1.0E-03	NA	NA	NA	NA	0.54	1.5E-08	1
Barium	6.1E+02	1.0E-03	NA	NA	NA	NA	0.54	3.3E-07	1
Chromium	1.5E+01	2.0E-03	NA	NA	NA	NA	0.54	1.6E-08	1
Cobalt	3.8E+00	4.0E-04	NA	NA	NA	NA	0.54	8.2E-10	1
Manganese	8.5E+01	1.0E-03	NA	NA	NA	NA	0.54	4.6E-08	1
Trichloroethene	3.0E+00	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.54	5.3E-08	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
μg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/μg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	7.0E-01	µg/m^3	(1)	mg/m^3	4.1E-06	1/(ug/m3)	2.9E-08	NA	NA	NA	NA	NA
			Exp. Route Total								2.9E-08					NA
		Exposure Point Total									2.9E-08					NA
	Exposure Medium Total										2.9E-08					NA
	Tapwater	Tapwater	Ingestion	4-Amino-2,6-dinitrotoluene	3.2E-01	µg/L	4.1E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	4.7E+01	µg/L	6.0E-04	mg/kg/day	8.0E-02	1/(mg/kg/day)	4.8E-05	NA	NA	NA	NA	NA
				Arsenic	2.8E+01	µg/L	3.6E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	5.4E-04	NA	NA	NA	NA	NA
				Barium	6.1E+02	µg/L	7.9E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chromium	1.5E+01	µg/L	1.9E-04	mg/kg/day	5.0E-01	1/(mg/kg/day)	3.0E-04	NA	NA	NA	NA	NA
				Cobalt	3.8E+00	µg/L	4.9E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Manganese	8.5E+01	µg/L	1.1E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	3.0E+00	µg/L	(1)	mg/kg/day	4.6E-02	1/(mg/kg/day)	2.5E-06	NA	NA	NA	NA	NA
			Exp. Route Total								8.9E-04					NA

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	4-Amino-2,6-dinitrotoluene	3.2E-01	µg/L	1.7E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	4.7E+01	µg/L	4.9E-06	mg/kg/day	8.0E-02	1/(mg/kg/day)	3.9E-07	NA	NA	NA	NA	NA
				Arsenic	2.8E+01	µg/L	1.9E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.8E-06	NA	NA	NA	NA	NA
				Barium	6.1E+02	µg/L	4.1E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chromium	1.5E+01	µg/L	2.0E-06	mg/kg/day	2.0E+01	1/(mg/kg/day)	1.2E-04	NA	NA	NA	NA	NA
				Cobalt	3.8E+00	µg/L	1.0E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Manganese	8.5E+01	µg/L	5.7E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	3.0E+00	µg/L	(1)	mg/kg/day	4.6E-02	1/(mg/kg/day)	3.9E-07	NA	NA	NA	NA	NA
			Exp. Route Total								1.2E-04					NA
		Exposure Point Total									1.0E-03					NA
	Exposure Medium Total										1.0E-03					NA
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	3.0E+00	µg/L	(1)	mg/m^3	4.1E-06	1/(µg/m3)	3.1E-06	NA	NA	NA	NA	NA
			Exp. Route Total								3.1E-06					NA
		Exposure Point Total									3.1E-06					NA
	Exposure Medium Total										3.1E-06					NA
Groundwater Total											1.0E-03					NA
Receptor Total											1E-03					NA

Notes:

(1) Intakes and exposure concentrations for trichloroethene were estimated on Table 7.3 Supplements A and B.

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

µg/L = microgram per liter

$\mu g/m^3$= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 7.3.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake Value 0-2 yrs	Intake Value 2-6 yrs	Intake Value 6-16 yrs	Intake Value 16-26 yrs	Intake Units	CSF/Unit Risk Value 0-2 yrs (ADAF=10)	CSF/Unit Risk Value 2-6 yrs (ADAF=3)	CSF/Unit Risk Value 6-16 yrs (ADAF=3)	CSF/Unit Risk Value 16-26 yrs (ADAF=1)	CSF/Unit Risk Units	Cancer Risk
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	7.0E-04	mg/m^3	8.0E-07	1.6E-06	4.0E-06	4.0E-06	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	$1/(\mu g/m^3)$	2.9E-08
	Groundwater	Tapwater	Ingestion	Chromium	1.5E+01	ug/L	2.1E-05	4.2E-05	6.4E-05	6.4E-05	mg/kg-day	5.0E+00	1.5E+00	1.5E+00	5.0E-01	1/(mg/kg-day)	3.0E-04
				Trichloroethene	3.0E+00	ug/L	4.3E-06	8.5E-06	1.3E-05	1.3E-05	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	1/(mg/kg-day)	1.1E-06
			Dermal	Chromium	1.5E+01	ug/L	1.9E-07	3.7E-07	7.1E-07	7.1E-07	mg/kg-day	2.0E+02	6.0E+01	6.0E+01	2.0E+01	1/(mg/kg-day)	1.2E-04
				Trichloroethene	3.0E+00	ug/L	6.2E-07	1.2E-06	2.1E-06	2.1E-06	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	1/(mg/kg-day)	1.7E-07
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	3.0E+00	ug/L	4.1E-05	8.2E-05	2.1E-04	2.1E-04	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	$1/(\mu g/m^3)$	1.5E-06

Notes:
ADAF = Age-dependent adjustment factor
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
$\mu g/m^3$ = microgram per cubic meter
mg/m^3 = milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.3.RME SUPPLEMENT B

CALCULATION OF CHEMICAL CANCER RISKS FOR TRICHLOROETHENE

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	(1)
Groundwater	Indoor Air	Indoor Air	Inhalation	Trichloroethene (Kidney)	7.0E-04	mg/m^3	(2)	mg/kg/day	1.0E-06	1/(µg/m3)	3E-08
				Trichloroethene (NHL + Liver)	7.0E-04	mg/m^3	2.5E-04	mg/kg/day	3.1E-06	1/(µg/m3)	8E-10
			Exp. Route Total								3E-08
	Tapwater	Tapwater	Ingestion	Trichloroethene (Kidney)	3.0E+00	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	1E-06
				Trichloroethene (NHL + Liver)	3.0E+00	µg/L	3.9E-05	mg/kg/day	3.7E-02	1/(mg/kg/day)	1E-06
			Exp. Route Total								3E-06
			Dermal	Trichloroethene (Kidney)	3.0E+00	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	2E-07
				Trichloroethene (NHL + Liver)	3.0E+00	µg/L	6.0E-06	mg/kg/day	3.7E-02	1/(mg/kg/day)	2E-07
			Exp. Route Total								4E-07
	Household Air	Household Air	Inhalation	Trichloroethene (Kidney)	3.0E+00	µg/L	(2)	mg/m^3	1.0E-06	1/(µg/m3)	1E-06
				Trichloroethene (NHL + Liver)	3.0E+00	µg/L	5.3E-04	mg/m^3	3.1E-06	1/(µg/m3)	2E-06
			Exp. Route Total								3E-06

Notes:

(1) Carcinogenic risks were estimated for trichloroethene by summing the risks for two different approaches: 1) Using the oral CSF factor for kidney cancer, which has a mutagenic mode of action (calculated in Table 7.3 RME Supplement A), and 2) using the CSF for non-Hodgkin lymphoma (NHL) and liver cancer.

(2) Intakes and exposure concentrations using the toxicity values for the kidney component of TCE were estimated on Table 7.3 RME Supplement A.

CSF = Cancer slope factor

µg/L = microgram per liter

mg/m^3= milligram per cubic meter

mg/kg/day = milligram per kilogram per day

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	Arsenic	2.8E+01	µg/L	NA	NA	NA	NA	NA	8.4E-04	mg/kg/day	3.0E-04	mg/kg/day	2.8E+00
				Chromium	1.5E+01	µg/L	NA	NA	NA	NA	NA	4.5E-04	mg/kg/day	3.0E-03	mg/kg/day	1.5E-01
				Cobalt	3.8E+00	µg/L	NA	NA	NA	NA	NA	1.1E-04	mg/kg/day	3.0E-04	mg/kg/day	3.8E-01
				Manganese	8.5E+01	µg/L	NA	NA	NA	NA	NA	2.5E-03	mg/kg/day	2.4E-02	mg/kg/day	1.1E-01
			Exp. Route Total								NA					3.4E+00
Groundwater (cont.)	Tapwater	Tapwater	Dermal	Arsenic	2.8E+01	µg/L	NA	NA	NA	NA	NA	4.7E-06	mg/kg/day	3.0E-04	mg/kg/day	1.6E-02
				Chromium	1.5E+01	µg/L	NA	NA	NA	NA	NA	5.0E-06	mg/kg/day	7.5E-05	mg/kg/day	6.6E-02
				Cobalt	3.8E+00	µg/L	NA	NA	NA	NA	NA	2.5E-07	mg/kg/day	3.0E-04	mg/kg/day	8.5E-04
				Manganese	8.5E+01	µg/L	NA	NA	NA	NA	NA	1.4E-05	mg/kg/day	9.6E-04	mg/kg/day	1.5E-02
			Exp. Route Total								NA					9.8E-02
		Exposure Point Total									NA					3.5E+00
	Exposure Medium Total										NA					3.5E+00
Groundwater Total											NA					3.5E+00
Receptor Total											NA					4E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.4.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Arsenic	2.8E+01	1.0E-03	NA	NA	NA	NA	0.71	2.0E-08	1
Chromium	1.5E+01	2.0E-03	NA	NA	NA	NA	0.71	2.1E-08	1
Cobalt	3.8E+00	4.0E-04	NA	NA	NA	NA	0.71	1.1E-09	1
Manganese	8.5E+01	1.0E-03	NA	NA	NA	NA	0.71	6.0E-08	1

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
μg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/μg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	Arsenic	2.8E+01	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	3.0E-04	mg/kg/day	4.7E+00
				Chromium	1.5E+01	µg/L	NA	NA	NA	NA	NA	7.4E-04	mg/kg/day	3.0E-03	mg/kg/day	2.5E-01
				Cobalt	3.8E+00	µg/L	NA	NA	NA	NA	NA	1.9E-04	mg/kg/day	3.0E-04	mg/kg/day	6.3E-01
				Manganese	8.5E+01	µg/L	NA	NA	NA	NA	NA	4.2E-03	mg/kg/day	2.4E-02	mg/kg/day	1.8E-01
			Exp. Route Total								NA					5.7E+00
Groundwater (cont.)	Tapwater	Tapwater	Dermal	Arsenic	2.80E+01	µg/L	NA	NA	NA	NA	NA	6.2E-06	mg/kg/day	3.0E-04	mg/kg/day	2.1E-02
				Chromium	1.49E+01	µg/L	NA	NA	NA	NA	NA	6.5E-06	mg/kg/day	7.5E-05	mg/kg/day	8.7E-02
				Cobalt	3.80E+00	µg/L	NA	NA	NA	NA	NA	3.3E-07	mg/kg/day	3.0E-04	mg/kg/day	1.1E-03
				Manganese	8.49E+01	µg/L	NA	NA	NA	NA	NA	1.9E-05	mg/kg/day	9.6E-04	mg/kg/day	1.9E-02
			Exp. Route Total								NA					1.3E-01
		Exposure Point Total									NA					5.8E+00
	Exposure Medium Total										NA					5.8E+00
Groundwater Total											NA					5.8E+00
Receptor Total											NA					6E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.5.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Arsenic	2.8E+01	1.0E-03	NA	NA	NA	NA	0.54	1.5E-08	1
Chromium	1.5E+01	2.0E-03	NA	NA	NA	NA	0.54	1.6E-08	1
Cobalt	3.8E+00	4.0E-04	NA	NA	NA	NA	0.54	8.2E-10	1
Manganese	8.5E+01	1.0E-03	NA	NA	NA	NA	0.54	4.6E-08	1

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	Arsenic	2.8E+01	µg/L	3.6E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	5.4E-04	NA	NA	NA	NA	NA
				Chromium	1.5E+01	µg/L	1.9E-04	mg/kg/day	5.0E-01	1/(mg/kg/day)	3.0E-04	NA	NA	NA	NA	NA
				Cobalt	3.8E+00	µg/L	4.9E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Manganese	8.5E+01	µg/L	1.1E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								8.4E-04					NA
Groundwater (cont.)	Tapwater	Tapwater	Dermal	Arsenic	2.8E+01	µg/L	1.9E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.8E-06	NA	NA	NA	NA	NA
				Chromium	1.5E+01	µg/L	2.0E-06	mg/kg/day	2.0E+01	1/(mg/kg/day)	1.2E-04	NA	NA	NA	NA	NA
				Cobalt	3.8E+00	µg/L	1.0E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Manganese	8.5E+01	µg/L	5.7E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								1.2E-04					NA
		Exposure Point Total									9.6E-04					NA
	Exposure Medium Total										9.6E-04					NA
Groundwater Total											9.6E-04					NA
Receptor Total											1E-03					NA

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.6.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations										
							Intake					CSF/Unit Risk					Cancer Risk
					Value	Units	Value				Units	Value				Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)		
Groundwater	Groundwater	Tapwater	Ingestion	Chromium	1.5E+01	ug/L	2.1E-05	4.2E-05	6.4E-05	6.4E-05	mg/kg-day	5.0E+00	1.5E+00	1.5E+00	5.0E-01	1/(mg/kg-day)	3.0E-04
			Dermal	Chromium	1.5E+01	ug/L	1.9E-07	3.7E-07	7.1E-07	7.1E-07	mg/kg-day	2.0E+02	6.0E+01	6.0E+01	2.0E+01	1/(mg/kg-day)	1.2E-04

Notes:

ADAF = Age-dependent adjustment factor

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

$\mu g/m^3$= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	7.0E-01	μg/m^3	NA	NA	NA	NA	NA	6.7E-04	mg/m^3	2.0E-03	mg/m3	3.3E-01
			Exp. Route Total								NA					3.3E-01
		Exposure Point Total									NA					3.3E-01
	Exposure Medium Total										NA					3.3E-01
	Tapwater	Tapwater	Ingestion	4-Amino-2,6-dinitrotoluene	3.2E-01	μg/L	NA	NA	NA	NA	NA	9.6E-06	mg/kg/day	1.0E-04	mg/kg/day	9.6E-02
				RDX	4.7E+01	μg/L	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	4.0E-03	mg/kg/day	3.5E-01
				Barium	6.1E+02	μg/L	NA	NA	NA	NA	NA	1.8E-02	mg/kg/day	2.0E-01	mg/kg/day	9.2E-02
				Trichloroethene	3.0E+00	μg/L	NA	NA	NA	NA	NA	9.0E-05	mg/kg/day	5.0E-04	mg/kg/day	1.8E-01
			Exp. Route Total								NA					7.2E-01

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	4-Amino-2,6-dinitrotoluene	3.2E-01	μg/L	NA	NA	NA	NA	NA	4.1E-07	mg/kg/day	1.0E-04	mg/kg/day	4.1E-03
				RDX	4.7E+01	μg/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	4.0E-03	mg/kg/day	2.9E-03
				Barium	6.1E+02	μg/L	NA	NA	NA	NA	NA	1.0E-04	mg/kg/day	1.4E-02	mg/kg/day	7.3E-03
				Trichloroethene	3.0E+00	μg/L	NA	NA	NA	NA	NA	1.4E-05	mg/kg/day	5.0E-04	mg/kg/day	2.9E-02
			Exp. Route Total								NA					4.3E-02
		Exposure Point Total									NA					7.6E-01
	Exposure Medium Total										NA					7.6E-01
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	3.0E+00	μg/L	NA	NA	NA	NA	NA	1.4E-03	mg/m^3	2.0E-03	mg/m3	7.2E-01
			Exp. Route Total								NA					7.2E-01
		Exposure Point Total									NA					7.2E-01
	Exposure Medium Total										NA					7.2E-01
Groundwater Total											NA					1.8E+00
Receptor Total											NA					2E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
μg/L = microgram per liter
μg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.7.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
4-Amino-2,6-dinitrotoluene	3.2E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	1.8E-09	2
RDX	4.7E+01	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.71	5.0E-08	2
Barium	6.1E+02	1.0E-03	NA	NA	NA	NA	0.71	4.3E-07	1
Trichloroethene	3.0E+00	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.71	6.1E-08	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
μg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/μg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	7.0E-01	$\mu g/m^3$	NA	NA	NA	NA	NA	6.7E-04	mg/m^3	2.0E-03	mg/m3	3.3E-01
			Exp. Route Total								NA					3.3E-01
		Exposure Point Total									NA					3.3E-01
	Exposure Medium Total										NA					3.3E-01
	Tapwater	Tapwater	Ingestion	4-Amino-2,6-dinitrotoluene	3.2E-01	µg/L	NA	NA	NA	NA	NA	1.6E-05	mg/kg/day	1.0E-04	mg/kg/day	1.6E-01
				RDX	4.7E+01	µg/L	NA	NA	NA	NA	NA	2.3E-03	mg/kg/day	4.0E-03	mg/kg/day	5.9E-01
				Barium	6.1E+02	µg/L	NA	NA	NA	NA	NA	3.1E-02	mg/kg/day	2.0E-01	mg/kg/day	1.5E-01
				Trichloroethene	3.0E+00	µg/L	NA	NA	NA	NA	NA	1.5E-04	mg/kg/day	5.0E-04	mg/kg/day	3.0E-01
			Exp. Route Total								NA					1.2E+00

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	4-Amino-2,6-dinitrotoluene	3.20E-01	µg/L	NA	NA	NA	NA	NA	6.2E-07	mg/kg/day	1.0E-04	mg/kg/day	6.2E-03
				RDX	4.70E+01	µg/L	NA	NA	NA	NA	NA	1.8E-05	mg/kg/day	4.0E-03	mg/kg/day	4.4E-03
				Barium	6.12E+02	µg/L	NA	NA	NA	NA	NA	1.3E-04	mg/kg/day	1.4E-02	mg/kg/day	9.6E-03
				Trichloroethene	3.00E+00	µg/L	NA	NA	NA	NA	NA	2.2E-05	mg/kg/day	5.0E-04	mg/kg/day	4.4E-02
			Exp. Route Total								NA					6.4E-02
		Exposure Point Total									NA					1.3E+00
	Exposure Medium Total										NA					1.3E+00
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	3.0E+00	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/m^3	2.0E-03	mg/m3	7.2E-01
			Exp. Route Total								NA					7.2E-01
		Exposure Point Total									NA					7.2E-01
	Exposure Medium Total										NA					7.2E-01
Groundwater Total											NA					2.3E+00
Receptor Total											NA					2E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.8.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
East Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
4-Amino-2,6-dinitrotoluene	3.2E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	1.5E-09	2
RDX	4.7E+01	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.54	4.4E-08	2
Barium	6.1E+02	1.0E-03	NA	NA	NA	NA	0.54	3.3E-07	1
Trichloroethene	3.0E+00	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.54	5.3E-08	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	7.0E-01	μg/m^3	(1)	mg/m^3	4.1E-06	1/(ug/m3)	2.9E-08	NA	NA	NA	NA	NA
			Exp. Route Total								2.9E-08					NA
		Exposure Point Total									2.9E-08					NA
	Exposure Medium Total										2.9E-08					NA
	Tapwater	Tapwater	Ingestion	4-Amino-2,6-dinitrotoluene	3.2E-01	μg/L	4.1E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	4.7E+01	μg/L	6.0E-04	mg/kg/day	8.0E-02	1/(mg/kg/day)	4.8E-05	NA	NA	NA	NA	NA
				Barium	6.1E+02	μg/L	7.9E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	3.0E+00	μg/L	3.9E-05	mg/kg/day	4.6E-02	1/(mg/kg/day)	2.5E-06	NA	NA	NA	NA	NA
			Exp. Route Total								5.1E-05					NA

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	4-Amino-2,6-dinitrotoluene	3.2E-01	µg/L	1.7E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	4.7E+01	µg/L	4.9E-06	mg/kg/day	8.0E-02	1/(mg/kg/day)	3.9E-07	NA	NA	NA	NA	NA
				Barium	6.1E+02	µg/L	4.1E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	3.0E+00	µg/L	6.0E-06	mg/kg/day	4.6E-02	1/(mg/kg/day)	3.9E-07	NA	NA	NA	NA	NA
			Exp. Route Total								7.8E-07					NA
		Exposure Point Total									5.2E-05					NA
	Exposure Medium Total										5.2E-05					NA
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	3.0E+00	µg/L	(1)	mg/m^3	4.1E-06	1/(µg/m3)	3.1E-06	NA	NA	NA	NA	NA
			Exp. Route Total								3.1E-06					NA
		Exposure Point Total									3.1E-06					NA
	Exposure Medium Total										3.1E-06					NA
Groundwater Total											5.5E-05					NA
Receptor Total											5E-05					NA

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
$\mu g/m^3$= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.9.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations										
							Intake					CSF/Unit Risk					Cancer Risk
					Value	Units	Value				Units	Value				Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)		
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	7.0E-04	mg/m^3	8.0E-07	1.6E-06	4.0E-06	4.0E-06	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	$1/(\mu g/m^3)$	2.9E-08
		Tapwater	Ingestion	Trichloroethene	3.0E+00	ug/L	4.3E-06	8.5E-06	1.3E-05	1.3E-05	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	1/(mg/kg-day)	1.1E-06
			Dermal	Trichloroethene	3.0E+00	ug/L	6.2E-07	1.2E-06	2.1E-06	2.1E-06	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	1/(mg/kg-day)	1.7E-07
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	3.0E+00	ug/L	4.1E-05	8.2E-05	2.1E-04	2.1E-04	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	$1/(\mu g/m^3)$	1.5E-06

Notes:

ADAF = Age-dependent adjustment factor

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

$\mu g/m^3$= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 7.9.RME SUPPLEMENT B

CALCULATION OF CHEMICAL CANCER RISKS FOR TRICHLOROETHENE

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	(1)
Groundwater	Indoor Air	Indoor Air	Inhalation	Trichloroethene (Kidney)	7.0E-04	mg/m^3	(2)	mg/kg/day	1.0E-06	1/(µg/m3)	3E-08
				Trichloroethene (NHL + Liver)	7.0E-04	mg/m^3	2.5E-04	mg/kg/day	3.1E-06	1/(µg/m3)	8E-10
			Exp. Route Total								3E-08
	Tapwater	Tapwater	Ingestion	Trichloroethene (Kidney)	3.0E+00	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	1E-06
				Trichloroethene (NHL + Liver)	3.0E+00	µg/L	3.9E-05	mg/kg/day	3.7E-02	1/(mg/kg/day)	1E-06
			Exp. Route Total								3E-06
			Dermal	Trichloroethene (Kidney)	3.0E+00	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	2E-07
				Trichloroethene (NHL + Liver)	3.0E+00	µg/L	6.0E-06	mg/kg/day	3.7E-02	1/(mg/kg/day)	2E-07
			Exp. Route Total								4E-07
	Household Air	Household Air	Inhalation	Trichloroethene (Kidney)	3.0E+00	µg/L	(2)	mg/m^3	1.0E-06	1/(µg/m3)	1E-06
				Trichloroethene (NHL + Liver)	3.0E+00	µg/L	5.3E-04	mg/m^3	3.1E-06	1/(µg/m3)	2E-06
			Exp. Route Total								3E-06

Notes:

(1) Carcinogenic risks were estimated for trichloroethene by summing the risks for two different approaches: 1) Using the oral CSF factor for kidney cancer, which has a mutagenic mode of action (calculated in Table 7.9 RME Supplement A), and 2) using the CSF for non-Hodgkin lymphoma (NHL) and liver cancer.

(2) Intakes and exposure concentrations using the toxicity values for the kidney component of TCE were estimated on Table 7.9 RME Supplement A.

CSF = Cancer slope factor

µg/L = microgram per liter

mg/m^3= milligram per cubic meter

mg/kg/day = milligram per kilogram per day

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	3E-01	NA	3E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E-01	NA	3E-01
	Tapwater	Tapwater	4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	1E-01	NA	4E-03	1E-01
			RDX	NA	NA	NA	NA	Nervous	4E-01	NA	3E-03	4E-01
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	3E+00	NA	2E-02	3E+00
			Barium	NA	NA	NA	NA	Urinary	9E-02	NA	7E-03	1E-01
			Chromium	NA	NA	NA	NA	NOE	1E-01	NA	7E-02	2E-01
			Cobalt	NA	NA	NA	NA	Thyroid	4E-01	NA	8E-04	4E-01
			Manganese	NA	NA	NA	NA	Nervous	1E-01	NA	1E-02	1E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	2E-01	NA	3E-02	2E-01
		Exposure Point Total		NA	NA	NA	NA		4E+00	NA	1E-01	4E+00
	Exposure Medium Total			NA	NA	NA	NA		4E+00	NA	1E-01	4E+00
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	7E-01	NA	7E-01
		Exposure Point Total		NA	NA	NA	NA		NA	7E-01	NA	7E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	7E-01	NA	7E-01
Groundwater Total				NA	NA	NA	NA		4E+00	1E+00	1E-01	5E+00
Receptor Total				NA	NA	NA	NA		4E+00	1E+00	1E-01	5E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = No observed effect

Total Cardiovascular HI Across Media =	**4**
Total Dermal HI Across Media =	**3**
Total Developmental HI Across Media =	1
Total Thyroid HI Across Media =	0.4
Total Hepatic HI Across Media =	0.1
Total Immune HI Across Media =	1
Total Nervous HI Across Media =	0.5
Total Urinary HI Across Media =	0.1
Total NOE HI Across Media =	0.2

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	3E-01	NA	3E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E-01	NA	3E-01
	Tapwater	Tapwater	4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	2E-01	NA	6E-03	2E-01
			RDX	NA	NA	NA	NA	Nervous	6E-01	NA	4E-03	6E-01
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	5E+00	NA	2E-02	5E+00
			Barium	NA	NA	NA	NA	Urinary	2E-01	NA	1E-02	2E-01
			Chromium	NA	NA	NA	NA	NOE	2E-01	NA	9E-02	3E-01
			Cobalt	NA	NA	NA	NA	Thyroid	6E-01	NA	1E-03	6E-01
			Manganese	NA	NA	NA	NA	Nervous	2E-01	NA	2E-02	2E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	3E-01	NA	4E-02	3E-01
		Exposure Point Total		NA	NA	NA	NA		7E+00	NA	2E-01	7E+00
	Exposure Medium Total			NA	NA	NA	NA		7E+00	NA	2E-01	7E+00
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	7E-01	NA	7E-01
		Exposure Point Total		NA	NA	NA	NA		NA	7E-01	NA	7E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	7E-01	NA	7E-01
Groundwater Total				NA	NA	NA	NA		7E+00	1E+00	2E-01	8E+00
Receptor Total				NA	NA	NA	NA		7E+00	1E+00	2E-01	8E+00

Notes: HI = Hazard Index; NA = Not applicable or not available, NOE = No observed effect

Total Cardiovascular HI Across Media =	**6**
Total Dermal HI Across Media =	**5**
Total Developmental HI Across Media =	1
Total Thyroid HI Across Media =	0.6
Total Hepatic HI Across Media =	0.2
Total Immune HI Across Media =	1
Total Nervous HI Across Media =	0.8
Total Urinary HI Across Media =	0.2
Total NOE HI Across Media =	0.3

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Trichloroethene	NA	3E-08	NA	3E-08	NA	NA	NA	NA	NA
		Exposure Point Total		NA	3E-08	NA	3E-08		NA	NA	NA	NA
	Exposure Medium Total			NA	3E-08	NA	3E-08		NA	NA	NA	NA
	Tapwater	Tapwater	4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			RDX	5E-05	NA	4E-07	5E-05	NA	NA	NA	NA	NA
			Arsenic	5E-04	NA	3E-06	5E-04	NA	NA	NA	NA	NA
			Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chromium	3E-04	NA	1E-04	4E-04	NA	NA	NA	NA	NA
			Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Trichloroethene	3E-06	NA	4E-07	3E-06	NA	NA	NA	NA	NA
		Exposure Point Total		9E-04	NA	1E-04	1E-03		NA	NA	NA	NA
	Exposure Medium Total			9E-04	NA	1E-04	1E-03		NA	NA	NA	NA
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Trichloroethene	NA	3E-06	NA	3E-06	NA	NA	NA	NA	NA
		Exposure Point Total		NA	3E-06	NA	3E-06		NA	NA	NA	NA
	Exposure Medium Total			NA	3E-06	NA	3E-06		NA	NA	NA	NA
Groundwater Total				9E-04	3E-06	1E-04	1E-03		NA	NA	NA	NA
Receptor Total				9E-04	3E-06	1E-04	1E-03		NA	NA	NA	NA

Notes: NA = Not applicable or not available

TABLE 9.4.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	3E+00	NA	2E-02	3E+00
			Chromium	NA	NA	NA	NA	NOE	1E-01	NA	7E-02	2E-01
			Cobalt	NA	NA	NA	NA	Thyroid	4E-01	NA	8E-04	4E-01
			Manganese	NA	NA	NA	NA	Nervous	1E-01	NA	1E-02	1E-01
		Exposure Point Total		NA	NA	NA	NA		3E+00	NA	1E-01	4E+00
	Exposure Medium Total			NA	NA	NA	NA		3E+00	NA	1E-01	4E+00
Groundwater Total				NA	NA	NA	NA		3E+00	NA	1E-01	4E+00
Receptor Total				NA	NA	NA	NA		3E+00	NA	1E-01	4E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = No observed effect

Total Cardiovascular HI Across Media =	**3**
Total Dermal HI Across Media =	**3**
Total Thyroid HI Across Media =	0.4
Total Nervous HI Across Media =	0.1
Total NOE HI Across Media =	0.2

TABLE 9.5.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	5E+00	NA	2E-02	5E+00
			Chromium	NA	NA	NA	NA	NOE	2E-01	NA	9E-02	3E-01
			Cobalt	NA	NA	NA	NA	Thyroid	6E-01	NA	1E-03	6E-01
			Manganese	NA	NA	NA	NA	Nervous	2E-01	NA	2E-02	2E-01
		Exposure Point Total		NA	NA	NA	NA		6E+00	NA	1E-01	6E+00
	Exposure Medium Total			NA	NA	NA	NA		6E+00	NA	1E-01	6E+00
Groundwater Total				NA	NA	NA	NA		6E+00	NA	1E-01	6E+00
Receptor Total				NA	NA	NA	NA		6E+00	NA	1E-01	6E+00

Notes: HI = Hazard Index; NA = Not applicable or not available, NOE = No observed effect

Total Cardiovascular HI Across Media =	**5**
Total Dermal HI Across Media =	**5**
Total Thyroid HI Across Media =	0.6
Total Nervous HI Across Media =	0.2
Total NOE HI Across Media =	0.3

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	Arsenic	5E-04	NA	3E-06	5E-04	NA	NA	NA	NA	NA
			Chromium	3E-04	NA	1E-04	4E-04	NA	NA	NA	NA	NA
			Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		8E-04	NA	1E-04	1E-03		NA	NA	NA	NA
	Exposure Medium Total			8E-04	NA	1E-04	1E-03		NA	NA	NA	NA
Groundwater Total				8E-04	NA	1E-04	1E-03		NA	NA	NA	NA
Receptor Total				8E-04	NA	1E-04	1E-03		NA	NA	NA	NA

Notes: NA = Not applicable or not available

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	3E-01	NA	3E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E-01	NA	3E-01
	Tapwater	Tapwater	4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	1E-01	NA	4E-03	1E-01
			RDX	NA	NA	NA	NA	Nervous	4E-01	NA	3E-03	4E-01
			Barium	NA	NA	NA	NA	Urinary	9E-02	NA	7E-03	1E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	2E-01	NA	3E-02	2E-01
		Exposure Point Total		NA	NA	NA	NA		7E-01	NA	4E-02	8E-01
	Exposure Medium Total			NA	NA	NA	NA		7E-01	NA	4E-02	8E-01
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	7E-01	NA	7E-01
		Exposure Point Total		NA	NA	NA	NA		NA	7E-01	NA	7E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	7E-01	NA	7E-01
Groundwater Total				NA	NA	NA	NA		7E-01	1E+00	4E-02	2E+00
Receptor Total				NA	NA	NA	NA		7E-01	1E+00	4E-02	2E+00

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	1
Total Developmental HI Across Media =	1
Total Hepatic HI Across Media =	0.1
Total Immune HI Across Media =	1
Total Nervous HI Across Media =	0.4
Total Urinary HI Across Media =	0.1

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	3E-01	NA	3E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E-01	NA	3E-01
	Tapwater	Tapwater	4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	2E-01	NA	6E-03	2E-01
			RDX	NA	NA	NA	NA	Nervous	6E-01	NA	4E-03	6E-01
			Barium	NA	NA	NA	NA	Urinary	2E-01	NA	1E-02	2E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	3E-01	NA	4E-02	3E-01
		Exposure Point Total		NA	NA	NA	NA		1E+00	NA	6E-02	1E+00
	Exposure Medium Total			NA	NA	NA	NA		1E+00	NA	6E-02	1E+00
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	7E-01	NA	7E-01
		Exposure Point Total		NA	NA	NA	NA		NA	7E-01	NA	7E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	7E-01	NA	7E-01
Groundwater Total				NA	NA	NA	NA		1E+00	1E+00	6E-02	2E+00
Receptor Total				NA	NA	NA	NA		1E+00	1E+00	6E-02	2E+00

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	1
Total Developmental HI Across Media =	1
Total Hepatic HI Across Media =	0.2
Total Immune HI Across Media =	1
Total Nervous HI Across Media =	0.6
Total Urinary HI Across Media =	0.2

TABLE 9.9.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Trichloroethene	NA	3E-08	NA	3E-08	NA	NA	NA	NA	NA
		Exposure Point Total		NA	3E-08	NA	3E-08		NA	NA	NA	NA
	Exposure Medium Total			NA	3E-08	NA	3E-08		NA	NA	NA	NA
	Tapwater	Tapwater	4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			RDX	5E-05	NA	4E-07	5E-05	NA	NA	NA	NA	NA
			Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Trichloroethene	3E-06	NA	4E-07	3E-06	NA	NA	NA	NA	NA
		Exposure Point Total		5E-05	NA	8E-07	5E-05		NA	NA	NA	NA
	Exposure Medium Total			5E-05	NA	8E-07	5E-05		NA	NA	NA	NA
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Trichloroethene	NA	3E-06	NA	3E-06	NA	NA	NA	NA	NA
		Exposure Point Total		NA	3E-06	NA	3E-06		NA	NA	NA	NA
	Exposure Medium Total			NA	3E-06	NA	3E-06		NA	NA	NA	NA
Groundwater Total				5E-05	3E-06	8E-07	5E-05		NA	NA	NA	NA
Receptor Total				5E-05	3E-06	8E-07	5E-05		NA	NA	NA	NA

Notes: NA = Not applicable or not available

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,3,5-Trinitrobenzene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,4,6-Trinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,4-Dinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,6-Dinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2-Amino-4,6-dinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2-Nitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	3-Nitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4-Amino-2,6-dinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4-Nitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	HMX	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	MNX	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Nitrobenzene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	RDX	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Tetryl	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,4-Oxathiane	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2,4-Dinitrophenol	11	U	µg/L	11	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Benzoic acid	11	U	µg/L	11	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Hexachlorocyclopentadiene	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	J	µg/L	NA	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW1	EBP-MW1-20030528	WG	5/28/2003	44.5	54.5	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	1,3,5-Trinitrobenzene	0.24	J	µg/L	0.21	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	4-Amino-2,6-dinitrotoluene	0.32	=	µg/L	0.12	0.21

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	4-Nitrotoluene	0.42	U	µg/L	0.42	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	HMX	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	RDX	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_EBP	EBP-MW13	EBP-MW13-0319	WG	3/8/2019	50	60	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Acetone	2.7	J	µg/L	1.9	10
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Bromoform	1	UJ	µg/L	1	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Ethyl- benzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_EBP	EBP-MW13	EBP-MW13-R0319	WG	3/25/2019	50	60	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	DNX	0.26	U	µg/L	0.26	0.51
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	HMX	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_EBP	EBP-MW15	EBP-MW15-0319	WG	3/7/2019	27	37	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	DNX	0.26	U	µg/L	0.26	0.51
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	HMX	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	RDX	0.36	J	µg/L	0.16	0.41
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_GW_EBP	EBP-MW16	EBP-MW16-0319	WG	3/7/2019	25	35	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	3-Nitrotoluene	0.41	UJ	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	DNX	0.25	U	µg/L	0.25	0.51
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	HMX	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	MNX	0.29	U	µg/L	0.29	0.51
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_EBP	EBP-MW17	EBP-MW17-0319	WG	3/25/2019	40	50	TNX	0.25	U	µg/L	0.25	0.51
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	HMX	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_EBP	EBP-MW2	EBP-MW2-0319	WG	3/7/2019	133.5	143.5	Arsenic	6.1	J	µg/L	4	10
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Arsenic	16.8	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Barium	612	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Chromium	14.9	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,4-Oxathiane	0.97	U	µg/L	0.97	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2-Methylphenol	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Dichlorodifluoromethane	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Toluene	2	J	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	EBP-MW2-20030521	WG	5/21/2003	133.5	143.5	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW2	F05-EBP-MW2-GW-REG	WG	10/10/2005	133.5	143.5	Arsenic, Dissolved	11.9	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	F05-EBP-MW2-GW-REG	WG	10/10/2005	133.5	143.5	Arsenic	18.7	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	F06-EBP-MW2-GW-REG	WG	9/12/2006	133.5	143.5	Arsenic, Dissolved	16.3	J	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	F06-EBP-MW2-GW-REG	WG	9/12/2006	133.5	143.5	Arsenic	23.8	J	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	S06-EBP-MW2-GW-REG	WG	4/19/2006	133.5	143.5	Arsenic, Dissolved	17.2	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	S06-EBP-MW2-GW-REG	WG	4/19/2006	133.5	143.5	Arsenic	28	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	S07-EBP-MW2-GW-REG	WG	6/7/2007	133.5	143.5	Arsenic, Dissolved	12.6	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	S08-EBP-MW2-GW-REG	WG	5/6/2008	133.5	143.5	Arsenic, Dissolved	14.9	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW2	S08-EBP-MW2-GW-REG	WG	5/6/2008	133.5	143.5	Arsenic	21.8	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	DNX	0.26	U	µg/L	0.26	0.51
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	HMX	18	=	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	MNX	1	=	µg/L	0.3	0.51
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	RDX	17	=	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	Arsenic	8	U	µg/L	8	10
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Arsenic	2.5	J	µg/L	NA	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Barium	44.9	J	µg/L	NA	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chromium	0.76	J	µg/L	NA	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Selenium	3	J	µg/L	NA	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,4-Oxathiane	0.51	U	µg/L	0.51	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chlorobenzene	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW3	F05-EBP-MW3-GW-REG	WG	9/30/2005	14.5	24.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW3	F05-EBP-MW3-GW-REG	WG	9/30/2005	14.5	24.5	Ethane	1	U	µg/L	1	NA
AOC_GW_EBP	EBP-MW3	F05-EBP-MW3-GW-REG	WG	9/30/2005	14.5	24.5	Ethene	1	U	µg/L	1	NA
AOC_GW_EBP	EBP-MW3	F05-EBP-MW3-GW-REG	WG	9/30/2005	14.5	24.5	Methane	0.5	U	µg/L	0.5	NA
AOC_GW_EBP	EBP-MW3	F06-EBP-MW3-GW-REG	WG	9/12/2006	14.5	24.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW3	S06-EBP-MW3-GW-REG	WG	4/19/2006	14.5	24.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	1,3,5-Trinitrobenzene	0.2	U	µg/L	0.2	0.3
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.3
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2,4,6-Trinitrotoluene	0.2	U	µg/L	0.2	0.3
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	1
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	1
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2-Amino-4,6-dinitrotoluene	0.2	U	µg/L	0.2	1
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	3-Nitrotoluene	0.4	U	µg/L	0.4	2
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	4-Amino-2,6-dinitrotoluene	0.2	U	µg/L	0.2	1
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	4-Nitrotoluene	0.4	U	µg/L	0.4	2
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	DNX	0.46	J	µg/L	0.096	1
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	HMX	4.7	=	µg/L	0.2	0.3
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	MNX	1	=	µg/L	1	1
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	Nitrobenzene	0.2	U	µg/L	0.2	0.3
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	RDX	47	=	µg/L	1	1.5
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	Tetryl	0.2	U	µg/L	0.2	1
AOC_GW_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	TNX	0.4	U	µg/L	0.4	2
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Calcium	71900	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Magnesium	34500	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Sodium	30900	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,4-Oxathiane	0.46	U	µg/L	0.46	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4,6-Trichlorophenol	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	bis (2-ethylhexyl) phthalate	2	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	2	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Carbon tetrachloride	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW4	F06-EBP-MW4-GW-REG	WG	9/12/2006	34.5	44.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW4	S06-EBP-MW4-GW-REG	WG	4/19/2006	34.5	44.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	1,3,5-Trinitrobenzene	0.2	U	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2,4,6-Trinitrotoluene	0.2	U	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.25
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.25
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2-Amino-4,6-dinitrotoluene	0.2	U	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	3-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	4-Amino-2,6-dinitrotoluene	0.2	U	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	DNX	0.2	U	µg/L	0.2	0.98
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	HMX	1.4	=	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	MNX	0.14	J	µg/L	0.055	0.98
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	Nitrobenzene	0.2	U	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	RDX	3.3	=	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	Tetryl	0.2	U	µg/L	0.2	0.29
AOC_GW_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	TNX	0.39	U	µg/L	0.39	0.98
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Calcium	78500	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Magnesium	22300	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Sodium	9210	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,4-Oxathiane	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4-Dimethylphenol	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Chlorobenzene	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Xylene, o-	1	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Xylenes, total	1	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW5	F05-EBP-MW5-GW-REG	WG	10/6/2005	35	45	1,4-Oxathiane	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	EBP-MW5	F05-EBP-MW5-GW-REG	WG	10/6/2005	35	45	Ethane	1	U	µg/L	1	NA
AOC_GW_EBP	EBP-MW5	F05-EBP-MW5-GW-REG	WG	10/6/2005	35	45	Ethene	1	U	µg/L	1	NA
AOC_GW_EBP	EBP-MW5	F05-EBP-MW5-GW-REG	WG	10/6/2005	35	45	Methane	3.73	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW5	F06-EBP-MW5-GW-REG	WG	9/12/2006	35	45	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW5	S06-EBP-MW5-GW-REG	WG	4/19/2006	35	45	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	4-Nitrotoluene	0.42	U	µg/L	0.42	1
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	HMX	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	RDX	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Calcium	61800	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Magnesium	45000	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Sodium	32700	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,4-Oxathiane	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4,6-Trichlorophenol	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Carbon tetrachloride	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EBP-MW6	F05-EBP-MW6-GW-REG	WG	10/6/2005	65.1	75.1	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW6	F05-EBP-MW6-GW-REG	WG	10/6/2005	65.1	75.1	Ethane	1	U	µg/L	1	NA
AOC_GW_EBP	EBP-MW6	F05-EBP-MW6-GW-REG	WG	10/6/2005	65.1	75.1	Ethene	1	U	µg/L	1	NA
AOC_GW_EBP	EBP-MW6	F05-EBP-MW6-GW-REG	WG	10/6/2005	65.1	75.1	Methane	7.82	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	F06-EBP-MW6-GW-REG	WG	9/12/2006	65.1	75.1	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Aluminum, Dissolved	75	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Antimony, Dissolved	6.8	U	µg/L	6.8	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Arsenic, Dissolved	5.5	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Barium, Dissolved	40.9	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Beryllium, Dissolved	0.8	U	µg/L	0.8	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Cadmium, Dissolved	0.48	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Calcium, Dissolved	67000	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Chromium, Dissolved	0.73	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Cobalt, Dissolved	1.9	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Copper, Dissolved	1.8	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Iron, Dissolved	15	U	µg/L	15	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Lead, Dissolved	1.7	U	µg/L	1.7	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Magnesium, Dissolved	46400	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Manganese, Dissolved	26.8	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Mercury, Dissolved	0.1	U	µg/L	0.1	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Nickel, Dissolved	17	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Potassium, Dissolved	4750	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Selenium, Dissolved	2.8	U	µg/L	2.8	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Silver, Dissolved	0.9	U	µg/L	0.9	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Sodium, Dissolved	30300	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Thallium, Dissolved	2.9	U	µg/L	2.9	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Vanadium, Dissolved	1.1	U	µg/L	1.1	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Zinc, Dissolved	7	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Aluminum	194	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Antimony	6.8	U	µg/L	6.8	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Arsenic	2.8	U	µg/L	2.8	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Barium	47	B	µg/L	NA	NA

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Beryllium	0.8	U	µg/L	0.8	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Cadmium	0.36	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Calcium	69300	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Chromium	1.8	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Cobalt	3.8	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Copper	4.1	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Iron	420	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Lead	1.7	U	µg/L	1.7	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Magnesium	47600	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Manganese	84.9	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Mercury	0.1	U	µg/L	0.1	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Nickel	20.4	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Potassium	4910	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Selenium	2.8	U	µg/L	2.8	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Silver	0.9	U	µg/L	0.9	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Sodium	30900	=	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Thallium	2.9	U	µg/L	2.9	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Vanadium	1.2	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Zinc	9.8	B	µg/L	NA	NA
AOC_GW_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	HMX	0.2	U	µg/L	0.2	0.4
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	DNX	0.26	U	µg/L	0.26	0.51
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	HMX	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_EBP	EBP-MW9	EBP-MW9-0319	WG	3/8/2019	50	60	Arsenic	6.4	J	µg/L	4	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	1,3,5-Trinitrobenzene	0.43	U	µg/L	0.43	1.1
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.43
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	2,4,6-Trinitrotoluene	0.43	U	µg/L	0.43	0.43
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.43
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	2-Nitrotoluene	0.21	U	µg/L	0.21	0.43
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	3-Nitrotoluene	0.43	U	µg/L	0.43	0.43
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	4-Nitrotoluene	0.43	U	µg/L	0.43	1.1
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	DNX	0.27	U	µg/L	0.27	0.53
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	HMX	0.21	U	µg/L	0.21	0.43
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	MNX	0.31	U	µg/L	0.31	0.53
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	Nitrobenzene	0.21	U	µg/L	0.21	0.43
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	RDX	0.43	U	µg/L	0.43	0.43
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	Tetryl	0.21	U	µg/L	0.21	0.26
AOC_GW_EBP	EDA-1	EDA-1-0319	WG	3/8/2019	16	25.8	TNX	0.27	U	µg/L	0.27	0.53
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Barium	66.9	J	µg/L	NA	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Selenium	3.5	J	µg/L	NA	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,4-Oxathiane	0.99	U	µg/L	0.99	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	bis (2-chloroethyl) ether	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Vinyl chloride	3	U	µg/L	3	NA

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-1	EDA-1-20030530	WG	5/30/2003	16	25.8	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1.1
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	4-Nitrotoluene	0.42	U	µg/L	0.42	1.1
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	DNX	0.54	=	µg/L	0.26	0.53
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	HMX	6	J	µg/L	0.21	0.42
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	MNX	0.85	=	µg/L	0.31	0.53
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	RDX	13	=	µg/L	0.42	0.42
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	TNX	0.26	U	µg/L	0.26	0.53
AOC_GW_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	Arsenic	8	U	µg/L	8	10
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Barium	111	J	µg/L	NA	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Selenium	5	J	µg/L	NA	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,4-Oxathiane	0.65	U	µg/L	0.65	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Benzoic acid	10	U	µg/L	10	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	2	J	µg/L	NA	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	trans-1,3-Dichloropropene	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-2	F05-EDA-02-GW-REG	WG	10/3/2005	17.8	27.4	1,4-Oxathiane	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	EDA-2	F05-EDA-02-GW-REG	WG	10/3/2005	17.8	27.4	Ethane	1	U	µg/L	1	NA
AOC_GW_EBP	EDA-2	F05-EDA-02-GW-REG	WG	10/3/2005	17.8	27.4	Ethene	1	U	µg/L	1	NA
AOC_GW_EBP	EDA-2	F05-EDA-02-GW-REG	WG	10/3/2005	17.8	27.4	Methane	0.5	U	µg/L	0.5	NA
AOC_GW_EBP	EDA-2	F06-EDA-02-GW-REG	WG	9/11/2006	17.8	27.4	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EDA-2	S06-EDA-02-GW-REG	WG	4/18/2006	17.8	27.4	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Barium	96.5	J	µg/L	NA	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Mercury	0.17	=	µg/L	NA	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,4-Oxathiane	0.78	U	µg/L	0.78	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Dimethyl phthalate	5	U	µg/L	5	NA

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Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	EDA-3-20030601	WG	6/1/2003	28	37.6	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-3	F05-EDA-03-GW-REG	WG	10/3/2005	28	37.6	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EDA-3	F05-EDA-03-GW-REG	WG	10/3/2005	28	37.6	Ethane	1	U	µg/L	1	NA
AOC_GW_EBP	EDA-3	F05-EDA-03-GW-REG	WG	10/3/2005	28	37.6	Ethene	1	U	µg/L	1	NA
AOC_GW_EBP	EDA-3	F05-EDA-03-GW-REG	WG	10/3/2005	28	37.6	Methane	0.5	U	µg/L	0.5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-3	F06-EDA-03-GW-REG	WG	9/11/2006	28	37.6	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EDA-3	S06-EDA-03-GW-REG	WG	4/18/2006	28	37.6	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EDA-3	S08-EDA-03-GW-REG	WG	5/8/2008	28	37.6	RDX	14.5	=	µg/L	NA	NA
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	1,3,5-Trinitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	1,3-Dinitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	2,4,6-Trinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	2,4-Dinitrotoluene	0.1	U	µg/L	0.1	0.13
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	2,6-Dinitrotoluene	0.1	U	µg/L	0.1	0.13
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	2-Amino-4,6-dinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	2-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	3-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	4-Amino-2,6-dinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	4-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	DNX	0.1	U	µg/L	0.1	0.5
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	HMX	73	=	µg/L	20	20
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	MNX	0.1	U	µg/L	0.1	0.5
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	Nitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	RDX	0.31	=	µg/L	0.1	0.15
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	Tetryl	0.1	U	µg/L	0.1	0.15
AOC_GW_EBP	EDA-4	EDA-4-0618	WG	6/24/2018	9.4	18.4	TNX	0.2	U	µg/L	0.2	0.5
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Barium	59.5	J	µg/L	NA	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Mercury	0.02	J	µg/L	NA	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,4-Oxathiane	0.31	U	µg/L	0.31	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Benzoic acid	10	U	µg/L	10	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	trans-1,3-Dichloropropene	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	EDA-4-20030601	WG	6/1/2003	9.4	18.4	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	EDA-4	F05-EDA-04-GW-REG	WG	10/3/2005	9.4	18.4	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EDA-4	F05-EDA-04-GW-REG	WG	10/3/2005	9.4	18.4	Ethane	1	U	µg/L	1	NA
AOC_GW_EBP	EDA-4	F05-EDA-04-GW-REG	WG	10/3/2005	9.4	18.4	Ethene	1	U	µg/L	1	NA
AOC_GW_EBP	EDA-4	F05-EDA-04-GW-REG	WG	10/3/2005	9.4	18.4	Methane	0.5	U	µg/L	0.5	NA
AOC_GW_EBP	EDA-4	F06-EDA-04-GW-REG	WG	9/11/2006	9.4	18.4	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	EDA-4	S06-EDA-04-GW-REG	WG	4/18/2006	9.4	18.4	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,3,5-Trinitrobenzene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,4,6-Trinitrotoluene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,4-Dinitrotoluene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,6-Dinitrotoluene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2-Amino-4,6-dinitrotoluene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2-Nitrotoluene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	3-Nitrotoluene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4-Amino-2,6-dinitrotoluene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4-Nitrotoluene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	HMX	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	MNX	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Nitrobenzene	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	RDX	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Tetryl	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Barium	55.5	J	µg/L	NA	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,4-Oxathiane	0.86	U	µg/L	0.86	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4-Chloroaniline	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Methylene chloride	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	G-29	G-29-20030531	WG	5/31/2003	8	18	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,3,5-Trinitrobenzene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,4,6-Trinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,4-Dinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,6-Dinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2-Amino-4,6-dinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2-Nitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	3-Nitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4-Amino-2,6-dinitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4-Nitrotoluene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	HMX	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	MNX	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Nitrobenzene	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	RDX	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Tetryl	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Barium	123	J	µg/L	NA	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Selenium	9.5	J	µg/L	NA	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,4-Oxathiane	0.62	U	µg/L	0.62	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA

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Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Styrene	3	U	µg/L	3	NA

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Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-04	JAW-04-20030530	WG	5/30/2003	13	23	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,3,5-Trinitrobenzene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,4,6-Trinitrotoluene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,4-Dinitrotoluene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,6-Dinitrotoluene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2-Amino-4,6-dinitrotoluene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2-Nitrotoluene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	3-Nitrotoluene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4-Amino-2,6-dinitrotoluene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4-Nitrotoluene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	HMX	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	MNX	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Nitrobenzene	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	RDX	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Tetryl	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Barium	74.5	J	µg/L	NA	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,4-Oxathiane	0.84	U	µg/L	0.84	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4-Methylphenol	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Tetrachloroethene	3	U	µg/L	3	NA

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Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-05	JAW-05-20030531	WG	5/31/2003	7	17	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	1,1,1-Trichloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	1,1,2,2-Tetrachloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	1,1,2-Trichloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	1,1-Dichloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	1,1-Dichloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	1,2-Dichloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	1,2-Dichloropropane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	2-Hexanone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Acetone	25	U	µg/L	25	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Benzene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Bromodichloromethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Bromoform	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Bromomethane	2	U	µg/L	2	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Carbon disulfide	2	U	µg/L	2	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Carbon tetrachloride	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Chloro methane	2	U	µg/L	2	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Chlorobenzene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Chloroethane	2	U	µg/L	2	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Chloroform	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	cis-1,2-Dichloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	cis-1,3-Dichloropropene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Dibromochloromethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Ethyl- benzene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Methyl ethyl ketone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Methyl isobutyl ketone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Methylene chloride	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Styrene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Tetrachloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Toluene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	trans-1,2-Dichloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	trans-1,3-Dichloropropene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Trichloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Vinyl chloride	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	F05-JAW-06-GW-REG	WG	10/3/2005	16	26	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Barium	167	J	µg/L	NA	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Chromium	6.7	J	µg/L	NA	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,4-Dichlorobenzene	5	U	µg/L	5	NA

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Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,4-Oxathiane	0.17	U	µg/L	0.17	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	bis (2-ethylhexyl) phthalate	1	J	µg/L	NA	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Bromochloromethane	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Trichloroethene	3	J	µg/L	NA	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	JAW-06-20030601	WG	6/1/2003	16	26	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	1,1,1-Trichloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	1,1,2,2-Tetrachloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	1,1,2-Trichloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	1,1-Dichloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	1,1-Dichloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	1,2-Dichloroethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	1,2-Dichloropropane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	2-Hexanone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Acetone	25	U	µg/L	25	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Benzene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Bromodichloromethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Bromoform	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Bromomethane	2	U	µg/L	2	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Carbon disulfide	2	U	µg/L	2	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Carbon tetrachloride	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Chloro methane	2	U	µg/L	2	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Chlorobenzene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Chloroethane	2	U	µg/L	2	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Chloroform	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	cis-1,2-Dichloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	cis-1,3-Dichloropropene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Dibromochloromethane	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Ethyl- benzene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Methyl ethyl ketone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Methyl isobutyl ketone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Methylene chloride	5	U	µg/L	5	NA

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Styrene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Tetrachloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Toluene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	trans-1,2-Dichloroethene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	trans-1,3-Dichloropropene	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Trichloroethene	2	=	µg/L	NA	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Vinyl chloride	1	U	µg/L	1	NA
AOC_GW_EBP	JAW-06	S06-JAW-06-GW-REG	WG	4/18/2006	16	26	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	1,3,5-Trinitrobenzene	0.22	U	µg/L	0.22	0.23
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	1,3-Dinitrobenzene	0.11	U	µg/L	0.11	0.12
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	2,4,6-Trinitrotoluene	0.11	U	µg/L	0.11	0.12
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	2,4-Dinitrotoluene	0.089	U	µg/L	0.089	0.11
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	2,6-Dinitrotoluene	0.089	U	µg/L	0.089	0.11
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	2-Amino-4,6-dinitrotoluene	0.11	U	µg/L	0.11	0.12
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	2-Nitrotoluene	0.22	U	µg/L	0.22	0.23
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	3-Nitrotoluene	0.45	U	µg/L	0.45	0.45
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.17
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	4-Nitrotoluene	0.45	U	µg/L	0.45	0.46
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	DNX	0.28	U	µg/L	0.28	0.56
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	HMX	0.22	U	µg/L	0.22	0.23
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	MNX	0.32	U	µg/L	0.32	0.56
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	Nitrobenzene	0.22	U	µg/L	0.22	0.23
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	RDX	0.22	U	µg/L	0.22	0.23
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	Tetryl	0.11	U	µg/L	0.11	0.12
AOC_GW_EBP	JAW-06R	JAW-06R-0620	WG	6/10/2020	18	28	TNX	0.28	U	µg/L	0.28	0.56
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1.1
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	4-Nitrotoluene	0.42	U	µg/L	0.42	1.1
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	DNX	0.26	U	µg/L	0.26	0.53
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	HMX	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	MNX	0.31	U	µg/L	0.31	0.53
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	RDX	0.42	U	µg/L	0.42	0.42
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_EBP	JAW-07	JAW-07-0319	WG	3/7/2019	10	20	TNX	0.26	U	µg/L	0.26	0.53
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Arsenic	4	J	µg/L	NA	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Barium	75.7	J	µg/L	NA	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Mercury	0.07	J	µg/L	NA	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,4-Oxathiane	1.4	U	µg/L	1.4	NA

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Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Bromodichloromethane	3	U	µg/L	3	NA

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Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-07	JAW-07-20030601	WG	6/1/2003	10	20	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,3,5-Trinitrobenzene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4,6-Trinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4-Dinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,6-Dinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Amino-4,6-dinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Nitrotoluene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	3-Nitrotoluene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Amino-2,6-dinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Nitrotoluene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	HMX	5.2	=	µg/L	NA	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	MNX	0.48	J	µg/L	NA	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Nitrobenzene	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	RDX	7	=	µg/L	NA	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Tetryl	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Arsenic	2.5	J	µg/L	NA	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Barium	127	J	µg/L	NA	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,4-Oxathiane	0.64	U	µg/L	0.64	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA

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Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Bromoform	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Bromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Xylenes, total	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,3,5-Trinitrobenzene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,4,6-Trinitrotoluene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,4-Dinitrotoluene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,6-Dinitrotoluene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2-Amino-4,6-dinitrotoluene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2-Nitrotoluene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	3-Nitrotoluene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4-Amino-2,6-dinitrotoluene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4-Nitrotoluene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	HMX	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	MNX	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Nitrobenzene	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	RDX	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Tetryl	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Arsenic	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Barium	150	J	µg/L	NA	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Cadmium	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Chromium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Lead	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Mercury	0.2	U	µg/L	0.2	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Selenium	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Silver	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,4-Oxathiane	0.77	U	µg/L	0.77	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,4,5-Trichlorophenol	5	U	µg/L	5	NA

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Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2-Chlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	3-Nitroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4-Chloroaniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4-Methylphenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	4-Nitrophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Aniline	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Benzoic acid	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Benzyl alcohol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Carbazole	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Dibenzofuran	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Diethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Hexachloroethane	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Isophorone	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Pentachlorophenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Phenol	5	U	µg/L	5	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,1,2-Trichlorotrifluoroethane (Freon 113)	2	J	µg/L	NA	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	2-Hexanone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Acetone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Bromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Bromodichloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Bromoform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Bromomethane	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Carbon disulfide	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Chloro methane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Chlorobenzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Chloroethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Chloroform	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Dibromochloromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Dibromomethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Ethyl- benzene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Methylene chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Styrene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Tetrachloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Toluene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Trichloroethene	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Vinyl chloride	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Xylene, o-	3	U	µg/L	3	NA
AOC_GW_EBP	JAW-64	JAW-64-20030531	WG	5/31/2003	9	19	Xylenes, total	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	DNX	0.26	U	µg/L	0.26	0.51
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	HMX	18	=	µg/L	0.21	0.41
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	MNX	1	=	µg/L	0.3	0.51
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	RDX	17	=	µg/L	0.41	0.41
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	TNX	0.26	U	µg/L	0.26	0.51
AOC_Plume_EBP	EBP-MW3	EBP-MW3-0319	WG	3/6/2019	14.5	24.5	Arsenic	8	U	µg/L	8	10
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Arsenic	2.5	J	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Barium	44.9	J	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Cadmium	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chromium	0.76	J	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Lead	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Mercury	0.2	U	µg/L	0.2	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Selenium	3	J	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Silver	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,4-Dichlorobenzene	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,4-Oxathiane	0.51	U	µg/L	0.51	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Chlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	3-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Chloroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	4-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Aniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Benzyl alcohol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Carbazole	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dibenzofuran	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Diethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Hexachloroethane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Isophorone	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Phenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	2-Hexanone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Acetone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Bromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Bromodichloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Bromoform	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Bromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Carbon disulfide	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Carbon tetrachloride	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chloro methane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chlorobenzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Chloroform	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dibromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dibromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Ethyl- benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Methylene chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Styrene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Tetrachloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Toluene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Trichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Vinyl chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Xylene, o-	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	EBP-MW3-20030521	WG	5/21/2003	14.5	24.5	Xylenes, total	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW3	F05-EBP-MW3-GW-REG	WG	9/30/2005	14.5	24.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW3	F05-EBP-MW3-GW-REG	WG	9/30/2005	14.5	24.5	Ethane	1	U	µg/L	1	NA
AOC_Plume_EBP	EBP-MW3	F05-EBP-MW3-GW-REG	WG	9/30/2005	14.5	24.5	Ethene	1	U	µg/L	1	NA
AOC_Plume_EBP	EBP-MW3	F05-EBP-MW3-GW-REG	WG	9/30/2005	14.5	24.5	Methane	0.5	U	µg/L	0.5	NA
AOC_Plume_EBP	EBP-MW3	F06-EBP-MW3-GW-REG	WG	9/12/2006	14.5	24.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW3	S06-EBP-MW3-GW-REG	WG	4/19/2006	14.5	24.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	1,3,5-Trinitrobenzene	0.2	U	µg/L	0.2	0.3
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.3
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2,4,6-Trinitrotoluene	0.2	U	µg/L	0.2	0.3
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	1
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	1
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2-Amino-4,6-dinitrotoluene	0.2	U	µg/L	0.2	1
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	2-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	3-Nitrotoluene	0.4	U	µg/L	0.4	2
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	4-Amino-2,6-dinitrotoluene	0.2	U	µg/L	0.2	1
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	4-Nitrotoluene	0.4	U	µg/L	0.4	2
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	DNX	0.46	J	µg/L	0.096	1
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	HMX	4.7	=	µg/L	0.2	0.3
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	MNX	1	=	µg/L	1	1
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	Nitrobenzene	0.2	U	µg/L	0.2	0.3
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	RDX	47	=	µg/L	1	1.5
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	Tetryl	0.2	U	µg/L	0.2	1
AOC_Plume_EBP	EBP-MW4	EBP-MW4-0718	WG	7/12/2018	34.5	44.5	TNX	0.4	U	µg/L	0.4	2
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Calcium	71900	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Magnesium	34500	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Sodium	30900	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,4-Oxathiane	0.46	U	µg/L	0.46	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Chlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	3-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Chloroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	4-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Aniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Benzoic acid	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Benzyl alcohol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	bis (2-ethylhexyl) phthalate	2	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Carbazole	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dibenzofuran	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Diethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Hexachloroethane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Isophorone	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Pentachlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Phenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	2	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	2-Hexanone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Acetone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Bromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Bromodichloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Bromoform	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Bromomethane	3	U	µg/L	3	NA

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Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Carbon disulfide	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Chloro methane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Chlorobenzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Chloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Chloroform	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dibromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dibromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Ethyl- benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Methylene chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Styrene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Tetrachloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Toluene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Trichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Vinyl chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Xylene, o-	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	EBP-MW4-20030512	WG	5/12/2003	34.5	44.5	Xylenes, total	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW4	F06-EBP-MW4-GW-REG	WG	9/12/2006	34.5	44.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW4	S06-EBP-MW4-GW-REG	WG	4/19/2006	34.5	44.5	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	1,3,5-Trinitrobenzene	0.2	U	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2,4,6-Trinitrotoluene	0.2	U	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.25
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.25
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2-Amino-4,6-dinitrotoluene	0.2	U	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	2-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	3-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	4-Amino-2,6-dinitrotoluene	0.2	U	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	DNX	0.2	U	µg/L	0.2	0.98
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	HMX	1.4	=	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	MNX	0.14	J	µg/L	0.055	0.98
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	Nitrobenzene	0.2	U	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	RDX	3.3	=	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	Tetryl	0.2	U	µg/L	0.2	0.29
AOC_Plume_EBP	EBP-MW5	EBP-MW5-0718	WG	7/12/2018	35	45	TNX	0.39	U	µg/L	0.39	0.98
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Calcium	78500	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Magnesium	22300	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Sodium	9210	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,4-Oxathiane	0.84	U	µg/L	0.84	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4,6-Trichlorophenol	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Chlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	3-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Chloroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	4-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Aniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Benzoic acid	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Benzyl alcohol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Carbazole	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dibenzofuran	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Diethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Hexachloroethane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Isophorone	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Pentachlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Phenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	2-Hexanone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Acetone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Bromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Bromodichloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Bromoform	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Bromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Carbon disulfide	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Carbon tetrachloride	3	U	µg/L	3	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Chloro methane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Chlorobenzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Chloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Chloroform	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dibromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dibromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Ethyl- benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Methylene chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Styrene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Tetrachloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Toluene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Trichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Vinyl chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Xylene, o-	1	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW5	EBP-MW5-20030512	WG	5/12/2003	35	45	Xylenes, total	1	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW5	F05-EBP-MW5-GW-REG	WG	10/6/2005	35	45	1,4-Oxathiane	0.2	U	µg/L	0.2	NA
AOC_Plume_EBP	EBP-MW5	F05-EBP-MW5-GW-REG	WG	10/6/2005	35	45	Ethane	1	U	µg/L	1	NA
AOC_Plume_EBP	EBP-MW5	F05-EBP-MW5-GW-REG	WG	10/6/2005	35	45	Ethene	1	U	µg/L	1	NA
AOC_Plume_EBP	EBP-MW5	F05-EBP-MW5-GW-REG	WG	10/6/2005	35	45	Methane	3.73	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW5	F06-EBP-MW5-GW-REG	WG	9/12/2006	35	45	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW5	S06-EBP-MW5-GW-REG	WG	4/19/2006	35	45	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	4-Nitrotoluene	0.42	U	µg/L	0.42	1
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	DNX	0.26	U	µg/L	0.26	0.52
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	HMX	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	MNX	0.3	U	µg/L	0.3	0.52
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	RDX	0.42	U	µg/L	0.42	0.42
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_Plume_EBP	EBP-MW6	EBP-MW6-0319	WG	3/7/2019	65.1	75.1	TNX	0.26	U	µg/L	0.26	0.52
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Calcium	61800	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Magnesium	45000	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Sodium	32700	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,4-Oxathiane	0.86	U	µg/L	0.86	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Chlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	3-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Chloroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	4-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Aniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Benzoic acid	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Benzyl alcohol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Carbazole	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dibenzofuran	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Diethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Hexachloroethane	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Isophorone	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Pentachlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Phenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	2-Hexanone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Acetone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Bromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Bromodichloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Bromoform	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Bromomethane	3	U	µg/L	3	NA

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Carbon disulfide	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Chloro methane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Chlorobenzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Chloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Chloroform	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dibromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dibromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Ethyl- benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Methylene chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Styrene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Tetrachloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Toluene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Trichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Vinyl chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Xylene, o-	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	EBP-MW6-20030513	WG	5/13/2003	65.1	75.1	Xylenes, total	3	U	µg/L	3	NA
AOC_Plume_EBP	EBP-MW6	F05-EBP-MW6-GW-REG	WG	10/6/2005	65.1	75.1	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW6	F05-EBP-MW6-GW-REG	WG	10/6/2005	65.1	75.1	Ethane	1	U	µg/L	1	NA
AOC_Plume_EBP	EBP-MW6	F05-EBP-MW6-GW-REG	WG	10/6/2005	65.1	75.1	Ethene	1	U	µg/L	1	NA
AOC_Plume_EBP	EBP-MW6	F05-EBP-MW6-GW-REG	WG	10/6/2005	65.1	75.1	Methane	7.82	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	F06-EBP-MW6-GW-REG	WG	9/12/2006	65.1	75.1	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Aluminum, Dissolved	75	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Antimony, Dissolved	6.8	U	µg/L	6.8	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Arsenic, Dissolved	5.5	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Barium, Dissolved	40.9	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Beryllium, Dissolved	0.8	U	µg/L	0.8	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Cadmium, Dissolved	0.48	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Calcium, Dissolved	67000	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Chromium, Dissolved	0.73	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Cobalt, Dissolved	1.9	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Copper, Dissolved	1.8	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Iron, Dissolved	15	U	µg/L	15	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Lead, Dissolved	1.7	U	µg/L	1.7	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Magnesium, Dissolved	46400	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Manganese, Dissolved	26.8	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Mercury, Dissolved	0.1	U	µg/L	0.1	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Nickel, Dissolved	17	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Potassium, Dissolved	4750	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Selenium, Dissolved	2.8	U	µg/L	2.8	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Silver, Dissolved	0.9	U	µg/L	0.9	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Sodium, Dissolved	30300	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Thallium, Dissolved	2.9	U	µg/L	2.9	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Vanadium, Dissolved	1.1	U	µg/L	1.1	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Zinc, Dissolved	7	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Aluminum	194	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Antimony	6.8	U	µg/L	6.8	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Arsenic	2.8	U	µg/L	2.8	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Barium	47	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Beryllium	0.8	U	µg/L	0.8	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Cadmium	0.36	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Calcium	69300	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Chromium	1.8	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Cobalt	3.8	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Copper	4.1	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Iron	420	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Lead	1.7	U	µg/L	1.7	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Magnesium	47600	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Manganese	84.9	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Mercury	0.1	U	µg/L	0.1	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Nickel	20.4	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Potassium	4910	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Selenium	2.8	U	µg/L	2.8	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Silver	0.9	U	µg/L	0.9	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Sodium	30900	=	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Thallium	2.9	U	µg/L	2.9	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Vanadium	1.2	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	Zinc	9.8	B	µg/L	NA	NA
AOC_Plume_EBP	EBP-MW6	S06-EBP-MW6-GW-REG	WG	4/20/2006	65.1	75.1	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	DNX	0.25	U	µg/L	0.25	0.5
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	HMX	0.2	U	µg/L	0.2	0.4
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	MNX	0.29	U	µg/L	0.29	0.5
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	RDX	0.4	U	µg/L	0.4	0.4
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_Plume_EBP	EBP-MW7	EBP-MW7-0319	WG	3/7/2019	45	55	TNX	0.25	U	µg/L	0.25	0.5
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1.1
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	4-Nitrotoluene	0.42	U	µg/L	0.42	1.1
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	DNX	0.54	=	µg/L	0.26	0.53
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	HMX	6	J	µg/L	0.21	0.42
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	MNX	0.85	=	µg/L	0.31	0.53
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	RDX	13	=	µg/L	0.42	0.42
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	Tetryl	0.21	U	µg/L	0.21	0.25

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	TNX	0.26	U	µg/L	0.26	0.53
AOC_Plume_EBP	EDA-2	EDA-2-0319	WG	3/6/2019	17.8	27.4	Arsenic	8	U	µg/L	8	10
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Arsenic	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Barium	111	J	µg/L	NA	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Cadmium	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chromium	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Lead	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Mercury	0.2	U	µg/L	0.2	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Selenium	5	J	µg/L	NA	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Silver	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,4-Oxathiane	0.65	U	µg/L	0.65	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Chlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	3-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Chloroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	4-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Aniline	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Benzoic acid	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Benzyl alcohol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Carbazole	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dibenzofuran	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Diethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Hexachlorobutadiene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Hexachloroethane	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Isophorone	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	N-nitrosodiphenylamine	5	U	µg/L	5	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Pentachlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Phenol	5	U	µg/L	5	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	2	J	µg/L	NA	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	2-Hexanone	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Acetone	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Bromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Bromodichloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Bromoform	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Bromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Carbon disulfide	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chloro methane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chlorobenzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Chloroform	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dibromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dibromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Ethyl- benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Methylene chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Styrene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Tetrachloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Toluene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Trichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Vinyl chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Xylene, o-	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	EDA-2-20030530	WG	5/30/2003	17.8	27.4	Xylenes, total	3	U	µg/L	3	NA
AOC_Plume_EBP	EDA-2	F05-EDA-02-GW-REG	WG	10/3/2005	17.8	27.4	1,4-Oxathiane	0.2	U	µg/L	0.2	NA
AOC_Plume_EBP	EDA-2	F05-EDA-02-GW-REG	WG	10/3/2005	17.8	27.4	Ethane	1	U	µg/L	1	NA
AOC_Plume_EBP	EDA-2	F05-EDA-02-GW-REG	WG	10/3/2005	17.8	27.4	Ethene	1	U	µg/L	1	NA
AOC_Plume_EBP	EDA-2	F05-EDA-02-GW-REG	WG	10/3/2005	17.8	27.4	Methane	0.5	U	µg/L	0.5	NA
AOC_Plume_EBP	EDA-2	F06-EDA-02-GW-REG	WG	9/11/2006	17.8	27.4	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	EDA-2	S06-EDA-02-GW-REG	WG	4/18/2006	17.8	27.4	1,4-Oxathiane	0.19	U	µg/L	0.19	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,3,5-Trinitrobenzene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4,6-Trinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4-Dinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,6-Dinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Amino-4,6-dinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Nitrotoluene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	3-Nitrotoluene	0.64	U	µg/L	0.64	NA

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Amino-2,6-dinitrotoluene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Nitrotoluene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	HMX	5.2	=	µg/L	NA	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	MNX	0.48	J	µg/L	NA	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Nitrobenzene	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	RDX	7	=	µg/L	NA	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Tetryl	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Arsenic	2.5	J	µg/L	NA	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Barium	127	J	µg/L	NA	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Cadmium	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chromium	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Lead	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Mercury	0.2	U	µg/L	0.2	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Selenium	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Silver	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,2,4-Trichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,2-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,3-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,4-Dichlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,4-Oxathiane	0.64	U	µg/L	0.64	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,2'-Oxybis (1-chloro)propane	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4,5-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4,6-Trichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4-Dichlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4-Dimethylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2,4-Dinitrophenol	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Chloro naphthalene	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Chlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	3,3-Dichlorobenzidene	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	3-Nitroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4,6-Dinitro-2-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Bromophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Chloro-3-methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Chloroaniline	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Chlorophenyl phenyl ether	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Methylphenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	4-Nitrophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Aniline	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Benzoic acid	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Benzyl alcohol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	bis (2-chloroethoxy) methane	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	bis (2-chloroethyl) ether	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	bis (2-ethylhexyl) phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Butylbenzylphthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Carbazole	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dibenzofuran	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Diethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dimethyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Di-n-butyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Di-n-octyl phthalate	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Hexachlorobenzene	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Hexachlorobutadiene	5	U	µg/L	5	NA

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Hexachlorocyclopentadiene	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Hexachloroethane	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Isophorone	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	n-Nitroso-di-n-propylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	N-nitrosodiphenylamine	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Pentachlorophenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Phenol	5	U	µg/L	5	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1,1-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1,2,2-Tetrachloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1,2-Trichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1,2-Trichlorotrifluoroethane (Freon 113)	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,1-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,2-Dichloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	1,2-Dichloropropane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	2-Hexanone	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Acetone	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Bromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Bromodichloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Bromoform	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Bromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Carbon disulfide	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Carbon tetrachloride	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chloro methane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chlorobenzene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chloroethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Chloroform	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	cis-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	cis-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dibromochloromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dibromomethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Dichlorodifluoromethane	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Ethyl- benzene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Methyl ethyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Methyl isobutyl ketone	10	U	µg/L	10	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Methylene chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Styrene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Tetrachloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Toluene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	trans-1,2-Dichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	trans-1,3-Dichloropropene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Trichloroethene	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Trichlorofluoromethane (Freon 11)	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Vinyl chloride	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Xylene, o-	3	U	µg/L	3	NA
AOC_Plume_EBP	JAW-614	JAW-614-20030601	WG	6/1/2003	27	37	Xylenes, total	3	U	µg/L	3	NA

Notes:

(1) The data were reduced such that when a normal and duplicate sample were available, the highest detected concentration among normal or duplicate samples was used when a chemical was detected in any sample. If both results were non-detect, the lowest reported detection limit (i.e., reporting limit) was used.

NA = Not available

WG - groundwater

B - Inorganic, metals results detected below the RL. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J - compound was detected below the reporting limit in the sample

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit

= - detected
U - not detected
µg/L - microgram per liter

Non-detected Data Analysis: East Burn Pads

Chemicals that were 100 percent non-detected (ND) in groundwater were not identified as COPCs for groundwater; however, a qualitative evaluation of the 100 percent (%) ND chemicals within East Burn Pads (EBP) was conducted.

Detection limits (DLs) and reporting limits (RLs) for chemicals that were 100 % ND were compared to groundwater screening levels (SLs). Groundwater SLs are the USEPA Regional Screening levels (RSLs) for tap water (USEPA, 2023) using an excess lifetime cancer risk (ELCR) of $1x10^{-6}$ and a hazard quotient (HQ) of 1. The EBP ND chemicals and a comparison of the ND DLs and RLs to SLs is provided in Attachment 3 (Table 1). ND chemicals exceeding SLs are identified and discussed below with regard to the adequacy of DLs/RLs and potential to be related to former site activities.

Non-detected Chemicals Exceeding Screening Levels

Five explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene, 3-nitrotoluene, and nitrobenzene), one metal (thallium), one polycyclic aromatic hydrocarbon ([PAH], naphthalene), 13 semi-volatile organic compounds (SVOCs), and 18 volatile organic compounds (VOCs), have DLs and/or RLs exceeding SLs at the EBP. With the exception of 3-nitrotoluene, all ND chemicals with RLs greater than SLs also had DLs greater than SLs. Explosives with RLs and/or DLs greater than SLs had a dataset of 22 samples per explosive. Thallium and naphthalene were only analyzed in one sample each in the groundwater dataset. SVOCs with RLs and/or DLs greater than SLs had a data set of 12, 15, 17 or 18 samples per SVOC. VOCs with RLs and/or DLs greater than SLs had a data set of 20 samples per VOC with the exceptions of 1,1,1,2-tetrachloroethane, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane and 1,2-dibromoethane which were only sampled once in the groundwater data set.

One explosive (TNX), 9 SVOCs (1,3-dichlorobenzene, 1,4-oxathiane, 2-nitrophenol, 3-nitroanaline, 4-bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, 4-nitrophenol, carbazole and dimethyl phthalate) and 6 VOCs (1,1-dichloropropene, 1-chlorohexane, 2,2-dichloropropane, 4-isopropyltoluene, ethane and ethene) were consistently ND in the EBP data set, but SLs were not available for these ND chemicals. Therefore, those ND chemicals were not included in the ND assessment process.

Non-detected Chemicals Related to Former Site Activities

To determine whether ND data exceeding SLs could potentially be related to former site activities, the historical IAAAP facility-wide dataset for the non-Formerly Utilized Sites Remedial Action Program (FUSRAP) sites was evaluated, and results are provided in Attachment 3 (Table 2). The ND comparison included historically detected chemicals in all media; however, surface water and sediment are not an issue/present at EBP and soil is being addressed under the Operable Unit 1 Remedial Action.

- **ND Explosives**: 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene have been historically detected in groundwater, soil and surface water at IAAAP, and with the exception of 2-nitrotoluene and 3-nitrotoluene, all have been historically detected in sediment at IAAAP. It is noted that DLs (ranging from 0.089 to 0.86 ug/L) and RLs (ranging from 0.11 to 2 ug/L) for the 5 explosives with DLs or RLs greater than SLs are acceptably low for an explosives analysis. Additionally, when compared to the other ND explosive with DLs and RLs less than SLs, the SLs for the 5 ND explosives with DLs or RLs greater than SLs have the lowest SLs. As a result, having acceptably low DLs and RLs for explosives analysis, it is highly probable that the ND explosives with DLs or RLs greater than SLs are due to the relatively higher toxicity of these 5 explosives in comparison to the other analyzed ND explosives, and it is unlikely that any of the ND explosives are present in site groundwater.

- **ND Metals:** Thallium has been historically detected in soil, surface water and sediment at IAAAP, but not in groundwater. DLs for the ND metals are typical of an EPA SW 846 Method 6010 analysis (USEPA, 2014) where several other (18) metals have been detected (see Attachment 1 Table 2.1). Additionally, when compared to the other ND metals that did not have RLs or DLs greater than SLs, thallium has the lowest SL (0.2 ug/L) which is one to two orders of magnitude lower than the other ND metal SLs. The thallium oral RfD of $1x10^{-5}$ mg/kg-day in the RSL table is a provisional toxicity value presented in an appendix to the main Provisional Peer Reviewed Toxicity Value (PPRTV) document (USEPA, 2012). Due to the lack of availability of suitable human studies noted in the main document, USEPA decided that it was inappropriate to derive a chronic PPRTV for thallium and instead presented the oral RfD value as a screening toxicity value in an appendix. USEPA warns that users of screening toxicity values in an appendix to a PPRTV assessment should understand that there is considerably more uncertainty associated with the derivation of a supplemental screening toxicity value than for a value presented in the body of the PPRTV assessment. Due to the high level of uncertainty associated with this value, risks associated with thallium are typically evaluated qualitatively as opposed to calculating numerical risk estimations.

- **ND PAHs and SVOCs**: The one PAH with DLs and RLs greater than the SL (naphthalene), has been historically detected in groundwater, soil and sediment at IAAAP. None of the 13 SVOCs with RLs and/or DLs greater than SLs have been historically detected in sediment or surface water at IAAAP. Eight of the 13 SVOCs with RLs and/or DLs greater than SLs were historically detected in groundwater at IAAAP and all 13 of the SVOCs were historically detected in soil at IAAAP. As noted in Attachment 1, Table 2.1, only one SVOC (bis[2ethylhexyl]phthalate) was detected in the SVOC groundwater data set, and only detected twice out of 17 samples and at levels less than the SL. Additionally, the maximum DL for all 13 of the ND SVOCs with RLs and/or DLs greater than SLs was 5 ug/L which is an acceptably low DL for SVOC analysis. Based on the low DLs and RLs for the one PAH and 13 SVOC ND chemicals, it is highly probable that the ND PAH/SVOCs with DLs and/or RLs greater than SLs are due to the relatively higher toxicity of these chemicals in comparison to the 24 other analyzed ND SVOCs with screening levels, and it is unlikely that any of the ND SVOCs are present in site groundwater.

- **ND VOCs**: Of the 18 VOCs with RLs and DLs greater than SLs, 12 have been historically detected in groundwater at IAAAP, 6 have been historically detected in soil at IAAAP, 8 have been historically detected in surface water at IAAAP, and 2 have been historically detected in sediment at IAAAP. Although 7 VOCs were detected in the groundwater data set (Attachment 1, Table 2.1), only one VOC was detected above the SL (trichloroethene) and only detected twice out of 20 samples with a maximum DL of 3 ug/L. Similar to the detected VOCs, the 18 ND VOCs with RLs and DLs greater than SLs had acceptably low RLs and DLs, with the maximum RL of the 18 ND VOCs being 5 ug/L and the maximum DL being 3 ug/L. With no evidence of chemical interferences and consistently low RLs and DLs for both detected and ND VOCs, the ND VOCs with RLs and DLs greater than SLs are likely a result of the lower SLs/higher toxicity associated with the 18 ND VOCs, and none of the ND VOCs are likely present in site groundwater.

Conclusions

Five explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene, 3-nitrotoluene, and nitrobenzene), one metal (thallium), one PAH (naphthalene), 13 SVOCs, and 18 VOCs have DLs and/or

RLs exceeding SLs at the EBP. Although the DLs and/or RLs for these ND chemicals are greater than the SLs, based on the adequacy of DLs/RLs and comparison to historically detected chemicals in groundwater at IAAAP, further consideration of ND chemicals does not appear warranted in the EBP HHRA.

References

U.S. Environmental Protection Agency (USEPA). 2012. *Provisional Peer Reviewed Toxicity Values for Thallium and Compounds Metallic Thallium (7440-28-0), Thallium (I) acetate (563-68-8), Thallium (I) carbonate (6533-73-9), Thallium (I) chloride (7791-12-0), Thallium (I) nitrate (10102-45-1), and Thallium (I) sulfate (7446-18-6). Superfund Health Risk Technical Support Center*. National Center for Environmental Assessment Final. October.

USEPA. 2014. *Method 6010D (SW-846): Inductively Coupled Plasma-Atomic Emission Spectrometry*. Revision 4.

USEPA. 2023. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* May.

ATTACHMENT 3, TABLE 1
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
Explosives	99-65-0	1,3-Dinitrobenzene	ug/L	0 / 16	0.1	0.21	0.12	0.43	2	0	0
Explosives	118-96-7	2,4,6-Trinitrotoluene	ug/L	0 / 22	0.1	0.86	0.12	0.43	2.5	0	0
Explosives	121-14-2	2,4-Dinitrotoluene	ug/L	0 / 22	0.089	0.86	0.11	1	0.24	6	20
Explosives	606-20-2	2,6-Dinitrotoluene	ug/L	0 / 22	0.089	0.86	0.11	1	0.049	22	22
Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	ug/L	0 / 22	0.1	0.86	0.12	1	1.9	0	0
Explosives	88-72-2	2-Nitrotoluene	ug/L	0 / 22	0.2	0.86	0.23	1	0.31	8	21
Explosives	99-08-1	3-Nitrotoluene	ug/L	0 / 22	0.2	0.86	0.4	2	1.7	0	1
Explosives	99-99-0	4-Nitrotoluene	ug/L	0 / 22	0.2	0.86	0.46	2	4.3	0	0
Explosives	98-95-3	Nitrobenzene	ug/L	0 / 22	0.1	0.86	0.15	0.43	0.14	21	22
Explosives	479-45-8	Tetryl	ug/L	0 / 22	0.1	0.86	0.12	1	39	0	0
Explosives	13980-04-6	TNX	ug/L	0 / 16	0.2	0.4	0.5	2	--	--	--
Metals	7440-36-0	Antimony	ug/L	0 / 1	6.8	6.8	--	--	7.8	0	--
Metals	7440-41-7	Beryllium	ug/L	0 / 1	0.8	0.8	--	--	25	0	--
Metals	7439-92-1	Lead	ug/L	0 / 14	1.7	10	--	--	15	0	--
Metals	7440-22-4	Silver	ug/L	0 / 14	0.9	10	--	--	94	0	--
Metals	7440-28-0	Thallium	ug/L	0 / 1	2.9	2.9	--	--	0.2	1	--
PAHs	91-20-3	Naphthalene	ug/L	0 / 1	0.8	0.8	1	1	0.12	1	1
SVOCs	120-82-1	1,2,4-Trichlorobenzene	ug/L	0 / 18	0.8	5	1	1	1.2	17	17
SVOCs	95-50-1	1,2-Dichlorobenzene	ug/L	0 / 18	0.4	5	1	1	300	0	0
SVOCs	541-73-1	1,3-Dichlorobenzene	ug/L	0 / 18	0.4	5	1	1	--	--	--
SVOCs	106-46-7	1,4-Dichlorobenzene	ug/L	0 / 18	0.4	5	1	1	0.48	17	18
SVOCs	15980-15-1	1,4-Oxathiane	ug/L	0 / 37	0.17	1.4	--	--	--	--	--
SVOCs	108-60-1	2,2'-Oxybis (1-chloro)propane	ug/L	0 / 17	5	5	--	--	710	0	--
SVOCs	95-95-4	2,4,5-Trichlorophenol	ug/L	0 / 17	5	5	--	--	1200	0	--
SVOCs	88-06-2	2,4,6-Trichlorophenol	ug/L	0 / 17	5	5	--	--	4.1	17	--
SVOCs	120-83-2	2,4-Dichlorophenol	ug/L	0 / 17	5	5	--	--	46	0	--
SVOCs	105-67-9	2,4-Dimethylphenol	ug/L	0 / 17	5	5	--	--	360	0	--
SVOCs	51-28-5	2,4-Dinitrophenol	ug/L	0 / 15	10	11	--	--	39	0	--
SVOCs	91-58-7	2-Chloro naphthalene	ug/L	0 / 17	5	5	--	--	750	0	--
SVOCs	95-57-8	2-Chlorophenol	ug/L	0 / 17	5	5	--	--	91	0	--
SVOCs	95-48-7	2-Methylphenol	ug/L	0 / 17	5	5	--	--	930	0	--
SVOCs	88-74-4	2-Nitroaniline	ug/L	0 / 17	5	5	--	--	190	0	--
SVOCs	88-75-5	2-Nitrophenol	ug/L	0 / 17	5	5	--	--	--	--	--
SVOCs	91-94-1	3,3-Dichlorobenzidene	ug/L	0 / 17	5	5	--	--	0.13	17	--
SVOCs	99-09-2	3-Nitroaniline	ug/L	0 / 17	5	5	--	--	--	--	--
SVOCs	534-52-1	4,6-Dinitro-2-methylphenol	ug/L	0 / 15	5	5	--	--	1.5	15	--
SVOCs	101-55-3	4-Bromophenyl phenyl ether	ug/L	0 / 17	5	5	--	--	--	--	--
SVOCs	59-50-7	4-Chloro-3-methylphenol	ug/L	0 / 17	5	5	--	--	1400	0	--
SVOCs	106-47-8	4-Chloroaniline	ug/L	0 / 17	5	5	--	--	0.37	17	--
SVOCs	7005-72-3	4-Chlorophenyl phenyl ether	ug/L	0 / 17	5	5	--	--	--	--	--
SVOCs	106-44-5	4-Methylphenol	ug/L	0 / 17	5	5	--	--	370	0	--
SVOCs	100-02-7	4-Nitrophenol	ug/L	0 / 17	5	5	--	--	--	--	--
SVOCs	62-53-3	Aniline	ug/L	0 / 17	5	5	--	--	13	0	--
SVOCs	65-85-0	Benzoic acid	ug/L	0 / 15	10	11	--	--	75000	0	--
SVOCs	100-51-6	Benzyl alcohol	ug/L	0 / 17	5	5	--	--	2000	0	--
SVOCs	111-91-1	bis (2-chloroethoxy) methane	ug/L	0 / 17	5	5	--	--	59	0	--
SVOCs	111-44-4	bis (2-chloroethyl) ether	ug/L	0 / 17	5	5	--	--	0.014	17	--
SVOCs	85-68-7	Butylbenzylphthalate	ug/L	0 / 17	5	5	--	--	16	0	--
SVOCs	86-74-8	Carbazole	ug/L	0 / 17	5	5	--	--	--	--	--
SVOCs	132-64-9	Dibenzofuran	ug/L	0 / 17	5	5	--	--	7.9	0	--
SVOCs	84-66-2	Diethyl phthalate	ug/L	0 / 17	5	5	--	--	15000	0	--
SVOCs	131-11-3	Dimethyl phthalate	ug/L	0 / 17	5	5	--	--	--	--	--

ATTACHMENT 3, TABLE 1
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
SVOCs	84-74-2	Di-n-butyl phthalate	ug/L	0 / 17	5	5	--	--	900	0	--
SVOCs	117-84-0	Di-n-octyl phthalate	ug/L	0 / 17	5	5	--	--	200	0	--
SVOCs	118-74-1	Hexachlorobenzene	ug/L	0 / 17	5	5	--	--	0.0098	17	--
SVOCs	87-68-3	Hexachlorobutadiene	ug/L	0 / 18	0.8	5	1	1	0.14	18	18
SVOCs	77-47-4	Hexachlorocyclopentadiene	ug/L	0 / 12	5	5	--	--	0.41	12	--
SVOCs	67-72-1	Hexachloroethane	ug/L	0 / 17	5	5	--	--	0.33	17	--
SVOCs	78-59-1	Isophorone	ug/L	0 / 17	5	5	--	--	78	0	--
SVOCs	621-64-7	n-Nitroso-di-n-propylamine	ug/L	0 / 17	5	5	--	--	0.011	17	--
SVOCs	86-30-6	N-nitrosodiphenylamine	ug/L	0 / 17	5	5	--	--	12	0	--
SVOCs	87-86-5	Pentachlorophenol	ug/L	0 / 15	5	5	--	--	0.041	15	--
SVOCs	108-95-2	Phenol	ug/L	0 / 17	5	5	--	--	5800	0	--
VOCs	630-20-6	1,1,1,2-Tetrachloroethane	ug/L	0 / 1	0.8	0.8	1	1	0.57	1	1
VOCs	71-55-6	1,1,1-Trichloroethane	ug/L	0 / 20	0.4	3	1	1	8000	0	0
VOCs	79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0 / 20	0.8	3	1	1	0.076	20	20
VOCs	79-00-5	1,1,2-Trichloroethane	ug/L	0 / 20	0.8	3	1	1	0.28	20	20
VOCs	75-34-3	1,1-Dichloroethane	ug/L	0 / 20	0.8	3	1	1	2.8	17	17
VOCs	75-35-4	1,1-Dichloroethene	ug/L	0 / 20	0.8	3	1	1	280	0	0
VOCs	563-58-6	1,1-Dichloropropene	ug/L	0 / 1	0.4	0.4	1	1	--	--	--
VOCs	87-61-6	1,2,3-Trichlorobenzene	ug/L	0 / 1	0.8	0.8	1	1	7	0	0
VOCs	96-18-4	1,2,3-Trichloropropane	ug/L	0 / 1	0.8	0.8	3	3	0.00075	1	1
VOCs	95-63-6	1,2,4-Trimethylbenzene	ug/L	0 / 1	0.4	0.4	1	1	56	0	0
VOCs	96-12-8	1,2-Dibromo-3-chloropropane	ug/L	0 / 1	1.6	1.6	5	5	0.00033	1	1
VOCs	106-93-4	1,2-Dibromoethane	ug/L	0 / 1	0.4	0.4	1	1	0.0075	1	1
VOCs	107-06-2	1,2-Dichloroethane	ug/L	0 / 20	0.4	3	1	1	0.17	20	20
VOCs	78-87-5	1,2-Dichloropropane	ug/L	0 / 20	0.4	3	1	1	0.85	19	20
VOCs	108-67-8	1,3,5-Trimethylbenzene	ug/L	0 / 1	0.4	0.4	1	1	60	0	0
VOCs	142-28-9	1,3-Dichloropropane	ug/L	0 / 1	0.2	0.2	1	1	370	0	0
VOCs	544-10-5	1-Chlorohexane	ug/L	0 / 1	0.4	0.4	1	1	--	--	--
VOCs	594-20-7	2,2-Dichloropropane	ug/L	0 / 1	0.8	0.8	1	1	--	--	--
VOCs	95-49-8	2-Chlorotoluene	ug/L	0 / 1	0.4	0.4	1	1	240	0	0
VOCs	591-78-6	2-Hexanone	ug/L	0 / 20	4	10	5	5	38	0	0
VOCs	99-87-6	4-Isopropyltoluene	ug/L	0 / 1	0.4	0.4	1	1	--	--	--
VOCs	71-43-2	Benzene	ug/L	0 / 20	0.4	3	1	1	0.46	19	20
VOCs	108-86-1	Bromobenzene	ug/L	0 / 1	0.4	0.4	1	1	62	0	0
VOCs	74-97-5	Bromochloromethane	ug/L	0 / 18	0.2	3	1	1	83	0	0
VOCs	75-27-4	Bromodichloromethane	ug/L	0 / 20	0.4	3	1	1	0.13	20	20
VOCs	75-25-2	Bromoform	ug/L	0 / 20	1	3	1	1	3.3	0	0
VOCs	74-83-9	Bromomethane	ug/L	0 / 20	0.8	3	2	2	7.5	0	0
VOCs	75-15-0	Carbon disulfide	ug/L	0 / 20	0.8	3	2	2	810	0	0
VOCs	56-23-5	Carbon tetrachloride	ug/L	0 / 20	0.4	3	2	2	0.46	19	20
VOCs	74-87-3	Chloro methane	ug/L	0 / 20	0.8	3	2	2	190	0	0
VOCs	108-90-7	Chlorobenzene	ug/L	0 / 20	0.4	3	1	1	78	0	0
VOCs	75-00-3	Chloroethane	ug/L	0 / 20	1.6	3	2	2	8300	0	0
VOCs	67-66-3	Chloroform	ug/L	0 / 20	0.4	3	1	1	0.22	20	20
VOCs	156-59-2	cis-1,2-Dichloroethene	ug/L	0 / 20	0.4	3	1	1	25	0	0
VOCs	10061-01-5	cis-1,3-Dichloropropene	ug/L	0 / 20	0.4	3	1	1	0.47	19	20
VOCs	124-48-1	Dibromochloromethane	ug/L	0 / 20	0.4	3	1	1	0.87	19	20
VOCs	74-95-3	Dibromomethane	ug/L	0 / 18	0.4	3	1	1	8.3	0	0
VOCs	75-71-8	Dichlorodifluoromethane	ug/L	0 / 18	0.8	3	2	2	200	0	0
VOCs	74-84-0	Ethane	ug/L	0 / 6	1	1	--	--	--	--	--
VOCs	74-85-1	Ethene	ug/L	0 / 6	1	1	--	--	--	--	--
VOCs	100-41-4	Ethyl- benzene	ug/L	0 / 20	0.4	3	1	1	1.5	17	17

ATTACHMENT 3, TABLE 1
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
VOCs	98-82-8	Isopropylbenzene	ug/L	0 / 1	0.4	0.4	1	1	450	0	0
VOCs	78-93-3	Methyl ethyl ketone	ug/L	0 / 20	4	10	6	6	5600	0	0
VOCs	108-10-1	Methyl isobutyl ketone	ug/L	0 / 20	3.2	10	5	5	6300	0	0
VOCs	1634-04-4	Methyl tert-butyl ether (MTBE)	ug/L	0 / 1	0.8	0.8	5	5	14	0	0
VOCs	75-09-2	Methylene chloride	ug/L	0 / 20	2	5	5	5	11	0	0
VOCs	104-51-8	N-Butylbenzene	ug/L	0 / 1	0.8	0.8	1	1	1000	0	0
VOCs	103-65-1	N-Propylbenzene	ug/L	0 / 1	0.4	0.4	1	1	660	0	0
VOCs	106-43-4	p-Chlorotoluene	ug/L	0 / 1	0.8	0.8	1	1	250	0	0
VOCs	135-98-8	sec-Butylbenzene	ug/L	0 / 1	0.4	0.4	1	1	2000	0	0
VOCs	100-42-5	Styrene	ug/L	0 / 20	0.8	3	1	1	1200	0	0
VOCs	98-06-6	tert-Butylbenzene	ug/L	0 / 1	0.4	0.4	1	1	690	0	0
VOCs	127-18-4	Tetrachloroethene	ug/L	0 / 20	0.4	3	1	1	11	0	0
VOCs	156-60-5	trans-1,2-Dichloroethene	ug/L	0 / 20	0.4	3	1	1	68	0	0
VOCs	10061-02-6	trans-1,3-Dichloropropene	ug/L	0 / 20	0.4	3	1	1	0.47	19	20
VOCs	75-69-4	Trichlorofluoromethane (Freon 11)	ug/L	0 / 18	0.8	3	2	2	5200	0	0
VOCs	75-01-4	Vinyl chloride	ug/L	0 / 20	0.2	3	1.5	1.5	0.019	20	20
VOCs	XYLMP	Xylene, m,p-	ug/L	0 / 1	0.8	0.8	2	2	190	0	0

Notes:
(1) Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2023) - Tapwater. Concentrations based on non-carcinogenic health effects are based on HQ=1; carcinogenic effects are based on risk of 1E-06. Available: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
1,3-Dichloropropene was used as a surrogate for cis-1,3-Dichloropropene
1,3-Dichloropropene was used as a surrogate for trans-1,3-Dichloropropene
Xylenes, total was used as a surrogate for Xylene, m,p-
[2] The maximum detection limit and reporting limit were compared to the screening level.

FOD = frequency of detect
ug/L = microgram per liter
NA = not available

ATTACHMENT 3, TABLE 2
Historically Detected Chemicals at IAAAP
Iowa Army Ammunition Plant, East Burn Pads, Middletown, Iowa

100% ND Chemical > SL	Detected in Groundwater	Detected in soil	Detected in Surface Water	Detected in Sediment
2,4-Dinitrotoluene	X	X	X	X
2,6-Dinitrotoluene	X	X	X	X
2-Nitrotoluene	X	X	X	--
3-Nitrotoluene	X	X	X	--
Nitrobenzene	X	X	X	X
Thallium	--	X	X	X
Naphthalene	X	X	--	X
1,2,4-Trichlorobenzene	X	X	--	--
1,4-Dichlorobenzene	--	X	--	--
2,4,6-Trichlorophenol	X	X	--	--
3,3-Dichlorobenzidene	--	X	--	--
4,6-Dinitro-2-methylphenol	X	X	--	--
4-Chloroaniline	--	X	--	--
bis (2-chloroethyl) ether	X	X	--	--
Hexachlorobenzene	X	X	--	--
Hexachlorobutadiene	--	X	--	--
Hexachlorocyclopentadiene	X	X	--	--
Hexachloroethane	--	X	--	--
n-Nitroso-di-n-propylamine	X	X	--	--
Pentachlorophenol	X	X	--	--
1,1,1,2-Tetrachloroethane	--	--	--	--
1,1,2,2-Tetrachloroethane	X	X	--	X
1,1,2-Trichloroethane	X	--	--	--
1,1-Dichloroethane	X	X	X	--
1,2,3-Trichloropropane	--	--	--	--
1,2-Dibromo-3-chloropropane	--	--	--	--
1,2-Dibromoethane	--	--	--	--
1,2-Dichloroethane	X	--	X	--
1,2-Dichloropropane	X	X	--	--
Benzene	X	X	X	--
Bromodichloromethane	X	--	X	--
Carbon tetrachloride	X	--	X	--
Chloroform	X	X	X	X
cis-1,3-Dichloropropene	--	--	--	--
Dibromochloromethane	X	--	X	--
Ethyl- benzene	X	X	--	--
trans-1,3-Dichloropropene	--	--	--	--
Vinyl chloride	X	--	X	--

X = chemical was historically detected
-- = chemical was not historically detected.

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

West Burn Pads Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Soil	Soil	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion, Inhalation	On-site	None	The West Burn Pads is open to recreational use; therefore, hunting is permitted at the site. However, soil is addressed under OU1 with land use controls for industrial land use.
	Surface Water	Surface Water	Spring Creek	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion	On-site	Quant	The West Burn Pads is partially open to recreational use; therefore, hunting is permitted at the site. The HHRA includes surface water and sediment data for the Explosives Disposal Area.
	Sediment	Sediment	Spring Creek	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion	On-site	Quant	The West Burn Pads is partially open to recreational use; therefore, hunting is permitted at the site. The HHRA includes surface water and sediment data for the Explosives Disposal Area.
	Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Site Worker	Adult	Inhalation	On-site	Quant (2)	Site workers could inhale volatile groundwater constituents in indoor air from vapor intrusion.
Future	Soil	Soil	Soil	Site Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	Soil is addressed under OU1 with land use controls for industrial land use.
				Construction/ Utility Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	
				Hypothetical Resident	Adult, Child	Dermal, Ingestion, Inhalation	On-site	None	
	Groundwater(1)	Tapwater	Tapwater	Site Worker	Adult	Dermal, Ingestion	On-site	Quant (2)	Future site workers could use groundwater as a potable water source. Site workers could ingest drinking water and could have dermal contact with groundwater while hand washing.
				Hypothetical Resident	Adult, Child	Dermal, Ingestion	On-site	Quant	Future hypothetical residents could use groundwater as a potable water source. Residents could ingest drinking water and could have dermal contact with groundwater while showering.
		Household Air (Domestic Use)	Vapors in House (Domestic Use)	Hypothetical Resident	Adult, Child	Inhalation	On-site	Quant	Future hypothetical residents could be exposed to vapors in household air via inhalation.
		Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Hypothetical Resident	Adult, Child	Inhalation	On-Site	Quant	Future hypothetical residents could inhale volatile groundwater constituents in indoor air from vapor intrusion.
	Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Construction/ Utility Worker	Adult	Dermal, Ingestion	On-site	Quant (2)	Construction/utility workers could incidentally ingest and have dermal contact with shallow groundwater in a trench while replacing the culverts within the West Burn Pads.
		Trench Air	Vapors in a Trench	Construction/ Utility Worker	Adult	Inhalation	On-site	Quant (2)	Construction/utility workers could inhale volatile groundwater constituents in trench air while replacing culverts within the West Burn Pads.

Notes:
Quant: Quantitative evaluation

(1) Groundwater is not currently being used as a potable water source and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the West Burn Pads is classified as Class IIB, a potential source of drinking water. Therefore, the HHRA evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This requires the evaluation of future residential exposures to groundwater.

(2) Potential exposures to groundwater are only estimated for a site worker and construction worker if the estimated risks for a hypothetical residential scenario exceed acceptable risk levels and COCs are identified for a residential scenario.

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current/Future (Hunter/Recreator)
Medium: Surface Water (Spring Creek)
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Surface Water Spring Creek	2691-41-0	HMX	2.80E-01		2.80E-01		µg/L	SCT2	1 / 6	0.19 - 0.22	2.8E-01	NA	1.6E+04	nc	NA	NA	No	BSL
	121-82-4	RDX	4.20E-01		4.20E-01		µg/L	SCT2	1 / 6	0.19 - 0.43	4.2E-01	NA	2.2E+02	ca	NA	NA	No	BSL
	7429-90-5	Aluminum	7.50E+02		1.60E+03		µg/L	EDA-SW02	2 / 2	40 - 40	1.6E+03	1.2E+03	2.8E+05	nc	NA	NA	No	BSL
	7440-39-3	Barium	1.20E+02		1.30E+02		µg/L	EDA-SW02	2 / 2	1.8 - 1.8	1.3E+02	1.5E+02	1.7E+04	nc	NA	NA	No	BSL
	7440-70-2	Calcium	7.10E+04		8.00E+04	J	µg/L	EDA-SW04	2 / 2	90 - 90	8.0E+04	NA	NUT		NA	NA	No	NUT
	7440-50-8	Copper	2.50E+00	J	2.50E+00	J	µg/L	EDA-SW02	1 / 2	1.9 - 2.5	2.5E+00	2.5E+00	1.1E+04	nc	NA	NA	No	BSL
	7439-89-6	Iron	7.20E+02		1.40E+03		µg/L	EDA-SW02	2 / 2	40 - 40	1.4E+03	9.7E+02	2.0E+05	nc	NA	NA	No	BSL
	7439-95-4	Magnesium	2.70E+04		3.10E+04	J	µg/L	EDA-SW04	2 / 2	40 - 40	3.1E+04	NA	NUT		NA	NA	No	NUT
	7439-96-5	Manganese	1.40E+02	J	1.70E+02		µg/L	EDA-SW02	2 / 2	3 - 3	1.7E+02	9.0E+01	1.3E+03	nc	NA	NA	No	BSL
	7439-98-7	Molybdenum	2.80E+00	J	2.80E+00	J	µg/L	EDA-SW04	1 / 2	2 - 4	2.8E+00	NA	1.4E+03	nc	NA	NA	No	BSL
	7440-02-0	Nickel	2.20E+00	J	2.20E+00	J	µg/L	EDA-SW02	1 / 2	2 - 4	2.2E+00	4.0E+00	3.3E+03	nc	NA	NA	No	BSL
	7440-09-7	Potassium	8.50E+03	J	9.70E+03		µg/L	EDA-SW02	2 / 2	90 - 90	9.7E+03	NA	NUT		NA	NA	No	NUT
	7440-23-5	Sodium	9.50E+04		1.20E+05	J	µg/L	EDA-SW04	2 / 2	90 - 90	1.2E+05	NA	NUT		NA	NA	No	NUT
	7440-62-2	Vanadium	4.40E+00	J	4.40E+00	J	µg/L	EDA-SW02	1 / 2	4 - 8	4.4E+00	8.0E+00	1.9E+02	nc	NA	NA	No	BSL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.10E+00	J	2.16E+02		µg/L	SCT2	4 / 5	0.18 - 0.4	2.2E+02	NA	1.1E+06	nc	NA	NA	No	BSL
	75-35-4	1,1-Dichloroethene	3.80E-01	J	3.80E-01	J	µg/L	SC5-TT	1 / 5	0.8 - 1	3.8E-01	NA	3.9E+03	nc	NA	NA	No	BSL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Sediment and Surface Water, Iowa Army Ammunition Plant, Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, July 2020).

(3) Regional Screening Levels for Recreational Surface Water (May 2023). Concentrations based on non-carcinogenic health effects are based upon HQ=0.1.

(4) Rationale Codes

Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
NA = not available
nc = noncarcinogenic
RDX = Royal Demolition Explosive
µg/L= microgram per liter

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current/Future (Hunter/Recreator)
Medium: Sediment (Spring Creek)
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (1)	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (5)
Sediment Spring Creek	7429-90-5	Aluminum	1.39E+03	2.36E+03	mg/kg	SC13-H	3 / 3	-	2.4E+03	2.0E+04	6.2E+05 nc	NA	NA	No	BSL
	7440-38-2	Arsenic	1.01E+01	1.63E+01	mg/kg	SC13-H	3 / 3	-	1.6E+01	2.1E+01	3.6E+01 ca	NA	NA	No	BSL
	7440-39-3	Barium	6.50E+01 J	2.94E+02 J	mg/kg	SC13-H	3 / 3	-	2.9E+02	4.3E+02	1.2E+05 nc	NA	NA	No	BSL
	7440-41-7	Beryllium	2.30E-01 J	4.90E-01	mg/kg	SC09-H, SC13-H	3 / 3	-	4.9E-01	1.8E+00	1.2E+03 nc	NA	NA	No	BSL
	7440-43-9	Cadmium	2.10E-01	2.10E-01	mg/kg	SC13-H	1 / 3	0.05 - 0.06	2.1E-01	7.4E-01	5.3E+01 nc	NA	NA	No	BSL
	7440-70-2	Calcium	1.56E+03	7.22E+03	mg/kg	SC13-H	3 / 3	-	7.2E+03	NA	NUT	NA	NA	No	NUT
	7440-47-3	Chromium	4.00E+00	7.30E+00	mg/kg	SC09-H, SC13-H	3 / 3	-	7.3E+00	2.9E+01	3.6E+01 ca	NA	NA	No	BSL
	7440-48-4	Cobalt	9.50E+00	3.38E+01	mg/kg	SC13-H	3 / 3	-	3.4E+01	4.3E+01	1.9E+02 nc	NA	NA	No	BSL
	7440-50-8	Copper	3.00E+00	5.80E+00	mg/kg	SC13-H	3 / 3	-	5.8E+00	3.0E+01	2.5E+04 nc	NA	NA	No	BSL
	7439-89-6	Iron	1.14E+04	2.07E+04	mg/kg	SC13-H	3 / 3	-	2.1E+04	4.4E+04	4.4E+05 nc	NA	NA	No	BSL
	7439-92-1	Lead	8.80E+00	1.64E+01	mg/kg	SC13-H	3 / 3	-	1.6E+01	5.7E+01	4.0E+02 L	NA	NA	No	BSL
	7439-95-4	Magnesium	7.12E+02	1.11E+03	mg/kg	SC09-H	3 / 3	-	1.1E+03	NA	NUT	NA	NA	No	NUT
	7439-96-5	Manganese	5.58E+02	3.66E+03	mg/kg	SC13-H	3 / 3	-	3.7E+03	2.3E+03	1.5E+04 nc	NA	NA	No	BSL
	7440-02-0	Nickel	6.20E+00	1.34E+01	mg/kg	SC13-H	3 / 3	-	1.3E+01	3.7E+01	1.2E+04 nc	NA	NA	No	BSL
	7440-09-7	Potassium	1.41E+02 J	2.51E+02 J	mg/kg	SC13-H	3 / 3	-	2.5E+02	NA	NUT	NA	NA	No	NUT
	7782-49-2	Selenium	4.50E-01 J	4.50E-01 J	mg/kg	SC13-H	1 / 3	0.31 - 0.34	4.5E-01	5.3E+00	3.1E+03 nc	NA	NA	No	BSL
	7440-22-4	Silver	5.00E-02 J	5.00E-02 J	mg/kg	SC13-H	1 / 3	0.05 - 0.05	5.0E-02	5.3E-01	3.1E+03 nc	NA	NA	No	BSL
	7440-23-5	Sodium	2.63E+02	5.61E+02	mg/kg	SC09-H	3 / 3	-	5.6E+02	NA	NUT	NA	NA	No	NUT
	7440-62-2	Vanadium	1.35E+01	3.03E+01	mg/kg	SC09-H	3 / 3	-	3.0E+01	6.6E+01	3.1E+03 nc	NA	NA	No	BSL
	7440-66-6	Zinc	1.36E+01 J	2.60E+01 J	mg/kg	SC09-H	3 / 3	-	2.6E+01	1.5E+02	1.9E+05 nc	NA	NA	No	BSL

Notes:

(1) Chemicals without a reported detection range are due to 100% of the chemical's results being detected and detected chemical results did not report detection limits.

(2) Maximum concentration is used for screening.

(3) Source: *Evaluation of Background Concentrations of Metals in Sediment and Surface Water, Iowa Army Ammunition Plant, Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, July 2020).

(4) Regional Screening Levels for Recreational Sediment (May 2023). Concentrations based on non-carcinogenic health effects are based upon HQ=0.1.
The RSL for Chromium(VI) was used for Chromium, total.

(5) Rationale Codes
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
HQ = hazard quotient
J = compound was detected below the reporting limit in the sample
L = lead action level
mg/kg = milligram per kilogram
NA = not available
nc = noncarcinogenic

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater/Household Air (Domestic Use)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
Tapwater/	99-35-4	1,3,5-Trinitrobenzene	2.2E-01	J	2.2E-01	J	ug/L	WBP-99-2	1 / 29	0.2 - 0.42	2.2E-01	NA	5.9E+01	nc	NA	NA	No	BSL
Vapors in House	99-65-0	1,3-Dinitrobenzene	2.8E+00	J	2.8E+00	J	ug/L	WBP-TTMW-11	1 / 29	0.1 - 0.21	2.8E+00	NA	2.0E-01	nc	NA	NA	Yes	ASL
(Domestic Use)	606-20-2	2,6-Dinitrotoluene	3.4E-01	J	1.0E+00	J	ug/L	WBP-TTMW-11	2 / 29	0.082 - 0.21	1.0E+00	NA	4.9E-02	ca	NA	NA	Yes	ASL
West Burn Pads Area	35572-78-2	2-Amino-4,6-dinitrotoluene	6.8E-02	J	5.4E-01		ug/L	WBP-TTMW-15	6 / 29	0.05 - 0.13	5.4E-01	NA	1.9E-01	nc	NA	NA	Yes	ASL
	19406-51-0	4-Amino-2,6-dinitrotoluene	5.8E-02	J	1.1E+00	J	ug/L	WBP-TTMW-02	9 / 29	0.058 - 0.13	1.1E+00	NA	1.9E-01	nc	NA	NA	Yes	ASL
	DNX	DNX	1.4E-01	J	3.6E+01	J	ug/L	WBP-TTMW-11	11 / 29	0.096 - 0.26	3.6E+01	NA	NTX		NA	NA	No	NTX
	2691-41-0	HMX	5.5E-01	J	4.5E+02		ug/L	JAW-23	20 / 29	0.2 - 20	4.5E+02	NA	1.0E+02	nc	4.0E+02	LHA	Yes	ASL
	5755-27-1	MNX	2.0E-01	J	3.3E+01	J	ug/L	WBP-TTMW-11	14 / 29	0.091 - 0.3	3.3E+01	NA	NTX		NA	NA	No	NTX
	121-82-4	RDX	5.1E-01		9.4E+02		ug/L	WBP-TTMW-11	17 / 29	0.21 - 39	9.4E+02	NA	9.7E-01	ca	2.0E+00	LHA	Yes	ASL
	479-45-8	Tetryl	1.6E-01	J	1.7E+00	J	ug/L	WBP-TTMW-11	2 / 29	0.083 - 0.21	1.7E+00	NA	3.9E+00	nc	NA	NA	No	BSL
	13980-04-6	TNX	1.6E-01	J	2.3E+01	J	ug/L	WBP-TTMW-11	5 / 29	0.078 - 0.26	2.3E+01	NA	NTX		NA	NA	No	NTX
	7440-38-2	Arsenic	3.7E+01		3.7E+01		ug/L	WBP-99-5	1 / 8	8 - 8	3.7E+01	3.3E+01	5.2E-02	ca	1.0E+01	MCL	Yes	ASL
	7440-39-3	Barium	1.5E+01		9.6E+02	J	ug/L	WBP-99-5	8 / 8	1.8 - 1.8	9.6E+02	4.3E+02	3.8E+02	nc	2.0E+03	MCL	Yes	ASL
	7440-43-9	Cadmium	6.3E-01		6.3E-01		ug/L	WBP-TTMW-03	1 / 8	0.4 - 0.4	6.3E-01	5.0E+00	1.8E-01	nc	5.0E+00	MCL	Yes	ASL
	7439-92-1	Lead	1.1E+00	J	1.2E+00	J	ug/L	WBP-MW9	2 / 8	1 - 2	1.2E+00	1.8E+01	1.5E+01	L	1.5E+01	MCL	No	BSL
	7782-49-2	Selenium	2.8E+00	J	2.8E+00	J	ug/L	WBP-TTMW-06	1 / 8	2 - 4	2.8E+00	1.0E+01	1.0E+01	nc	5.0E+01	MCL	No	BSL
	91-20-3	Naphthalene	2.7E-01	J	3.2E+00	J	ug/L	WBP-99-5	4 / 25	0.22 - 80	3.2E+00	NA	1.2E-01	ca	1.0E+02	LHA	Yes	ASL
	71-55-6	1,1,1-Trichloroethane	1.8E-01	J	6.5E-01	J	ug/L	WBP-TTMW-11	3 / 25	0.16 - 40	6.5E-01	NA	8.0E+02	nc	2.0E+02	MCL	No	BSL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	8.4E-01	J	1.8E+05	J	ug/L	WBP-99-6	19 / 25	0.18 - 800	1.8E+05	NA	1.0E+03	nc	NA	NA	Yes	ASL
	75-34-3	1,1-Dichloroethane	3.6E-01	J	3.5E+00	J	ug/L	WBP-TTMW-11	5 / 25	0.22 - 80	3.5E+00	NA	2.8E+00	ca	NA	NA	Yes	ASL
	75-35-4	1,1-Dichloroethene	2.4E-01	J	7.9E+01	J	ug/L	WBP-99-2	8 / 25	0.23 - 32	7.9E+01	NA	2.8E+01	nc	7.0E+00	MCL	Yes	ASL
	95-63-6	1,2,4-Trimethylbenzene	1.5E-01	J	3.9E+00	J	ug/L	WBP-99-6	5 / 25	0.15 - 40	3.9E+00	NA	5.6E+00	nc	NA	NA	No	BSL
	108-67-8	1,3,5-Trimethylbenzene	5.8E-01	J	1.3E+00	J	ug/L	WBP-99-6	3 / 25	0.16 - 40	1.3E+00	NA	6.0E+00	nc	NA	NA	No	BSL
	544-10-5	1-Chlorohexane	3.1E-01	J	3.1E-01	J	ug/L	WBP-MW9	1 / 25	0.19 - 40	3.1E-01	NA	NTX		NA	NA	No	NTX
	99-87-6	4-Isopropyltoluene	5.6E-01	J	7.0E-01	J	ug/L	WBP-99-6	3 / 25	0.2 - 40	7.0E-01	NA	NTX		NA	NA	No	NTX
	67-64-1	Acetone	7.8E+00	J	4.7E+02	J	ug/L	WBP-99-2	5 / 25	1.9 - 260	4.7E+02	NA	1.8E+03	nc	NA	NA	No	BSL
	71-43-2	Benzene	1.7E-01	J	4.7E-01	J	ug/L	WBP-99-6	4 / 25	0.16 - 40	4.7E-01	NA	4.6E-01	ca	5.0E+00	MCL	Yes	ASL
	74-83-9	Bromomethane	1.3E+00	J	8.4E+00	J	ug/L	WBP-TTMW-11	3 / 25	0.21 - 80	8.4E+00	NA	7.5E-01	nc	NA	NA	Yes	ASL
	75-15-0	Carbon disulfide	2.1E-01	J	6.8E+01	J	ug/L	WBP-99-6	2 / 25	0.17 - 80	6.8E+01	NA	8.1E+01	nc	NA	NA	No	BSL
	74-87-3	Chloro methane	2.9E+00	J	6.2E+00	J	ug/L	WBP-TTMW-11	2 / 25	0.8 - 80	6.2E+00	NA	1.9E+01	nc	NA	NA	No	BSL
	67-66-3	Chloroform	1.6E-01	J	2.1E+01	J	ug/L	WBP-99-2	6 / 25	0.16 - 16	2.1E+01	NA	2.2E-01	ca	8.0E+01	MCL	Yes	ASL
	156-59-2	cis-1,2-Dichloroethene	3.5E-01	J	5.7E+01	J	ug/L	WBP-TTMW-11	7 / 25	0.15 - 40	5.7E+01	NA	2.5E+00	nc	7.0E+01	MCL	Yes	ASL
	75-71-8	Dichlorodifluoromethane	3.3E-01	J	2.3E+02		ug/L	WBP-TTMW-01	9 / 25	0.31 - 80	2.3E+02	NA	2.0E+01	nc	NA	NA	Yes	ASL
	100-41-4	Ethylbenzene	4.3E-01	J	1.9E+00	J	ug/L	WBP-99-6	3 / 25	0.16 - 40	1.9E+00	NA	1.5E+00	ca	7.0E+02	MCL	Yes	ASL
	98-82-8	Isopropylbenzene	2.2E-01	J	3.6E-01	J	ug/L	WBP-99-6	2 / 25	0.19 - 40	3.6E-01	NA	4.5E+01	nc	NA	NA	No	BSL
	78-93-3	Methyl ethyl ketone	8.1E+00	J	8.1E+00	J	ug/L	WBP-99-5	1 / 25	4 - 400	8.1E+00	NA	5.6E+02	nc	4.0E+03	LHA	No	BSL

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater/Household Air (Domestic Use)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier		Maximum Concentration Qualifier		Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
	104-51-8	N-Butylbenzene	6.7E-01	J	9.3E-01	J	ug/L	WBP-99-6	3 / 25	0.14 - 80	9.3E-01	NA	1.0E+02	nc	NA	NA	No	BSL
	103-65-1	N-Propylbenzene	2.3E-01	J	6.1E-01	J	ug/L	WBP-99-6	3 / 25	0.16 - 40	6.1E-01	NA	6.6E+01	nc	NA	NA	No	BSL
	135-98-8	sec-Butylbenzene	4.9E-01	J	6.9E-01	J	ug/L	WBP-99-6	3 / 25	0.17 - 40	6.9E-01	NA	2.0E+02	nc	NA	NA	No	BSL
	108-88-3	Toluene	4.1E-01	J	8.1E+00	J	ug/L	WBP-99-6	5 / 25	0.17 - 40	8.1E+00	NA	1.1E+02	nc	1.0E+03	MCL	No	BSL
	156-60-5	trans-1,2-Dichloroethene	5.0E-01	J	5.0E-01	J	ug/L	WBP-TTMW-11	1 / 25	0.15 - 40	5.0E-01	NA	6.8E+00	nc	1.0E+02	MCL	No	BSL
	79-01-6	Trichloroethene	1.7E-01	J	5.4E+01	J	ug/L	WBP-TTMW-11	9 / 25	0.16 - 40	5.4E+01	NA	2.8E-01	nc	5.0E+00	MCL	Yes	ASL
	XYLMP	Xylene, m,p-	2.4E-01	J	2.9E+00	J	ug/L	WBP-99-6	4 / 25	0.15 - 80	2.9E+00	NA	1.9E+01	nc	NA	NA	No	BSL
	95-47-6	Xylene, o-	2.5E-01	J	2.8E+00	J	ug/L	WBP-99-6	4 / 25	0.19 - 40	2.8E+00	NA	1.9E+01	nc	NA	NA	No	BSL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Regional Screening Levels (RSL) for Tap Water (May 2023). Concentrations based on non-carcinogenic health effects are based on HQ=0.1.

(4) Values are the Federal Maximum Contaminant Levels (MCLs) and if no MCL was available, the EPA's (March 2018) Office of Water Lifetime Health Advisory (LHA) was provided.

(5) Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
DNX = 1,3-Dinitro-5-nitroso-1,3,5-triazinane
HQ = hazard quotient
HMX = Hot Melt Explosive
L = federal action level
J = compound was detected below the reporting limit in the sample
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
nc = noncarcinogenic
RDX = Royal Demolition Explosive
TNX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine
µg/L= microgram per liter

TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current (Site Worker) and Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier		Maximum Concentration Qualifier		Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Indoor Air	99-35-4	1,3,5-Trinitrobenzene	2.2E-01	J	2.2E-01	J	ug/L	WBP-99-2	1 / 29	0.2 - 0.42	2.2E-01	NA	NSV		NA	NA	No	NSV
(Vapor Intrusion)	99-65-0	1,3-Dinitrobenzene	2.8E+00	J	2.8E+00	J	ug/L	WBP-TTMW-11	1 / 29	0.1 - 0.21	2.8E+00	NA	NSV		NA	NA	No	NSV
West Burn Pads Area	606-20-2	2,6-Dinitrotoluene	3.4E-01	J	1.0E+00	J	ug/L	WBP-TTMW-11	2 / 29	0.082 - 0.21	1.0E+00	NA	NSV		NA	NA	No	NSV
	35572-78-2	2-Amino-4,6-dinitrotoluene	6.8E-02	J	5.4E-01		ug/L	WBP-TTMW-15	6 / 29	0.05 - 0.13	5.4E-01	NA	NSV		NA	NA	No	NSV
	19406-51-0	4-Amino-2,6-dinitrotoluene	5.8E-02	J	1.1E+00	J	ug/L	WBP-TTMW-02	9 / 29	0.058 - 0.13	1.1E+00	NA	NSV		NA	NA	No	NSV
	DNX	DNX	1.4E-01	J	3.6E+01	J	ug/L	WBP-TTMW-11	11 / 29	0.096 - 0.26	3.6E+01	NA	NSV		NA	NA	No	NSV
	2691-41-0	HMX	5.5E-01	J	4.5E+02		ug/L	JAW-23	20 / 29	0.2 - 20	4.5E+02	NA	NSV		NA	NA	No	NSV
	5755-27-1	MNX	2.0E-01	J	3.3E+01	J	ug/L	WBP-TTMW-11	14 / 29	0.091 - 0.3	3.3E+01	NA	NTX		NA	NA	No	NTX
	121-82-4	RDX	5.1E-01		9.4E+02		ug/L	WBP-TTMW-11	17 / 29	0.21 - 39	9.4E+02	NA	NSV		NA	NA	No	NSV
	479-45-8	Tetryl	1.6E-01	J	1.7E+00	J	ug/L	WBP-TTMW-11	2 / 29	0.083 - 0.21	1.7E+00	NA	NSV		NA	NA	No	NSV
	13980-04-6	TNX	1.6E-01	J	2.3E+01	J	ug/L	WBP-TTMW-11	5 / 29	0.078 - 0.26	2.3E+01	NA	NSV		NA	NA	No	NSV
	7440-38-2	Arsenic	3.7E+01		3.7E+01		ug/L	WBP-99-5	1 / 8	8 - 8	3.7E+01	3.3E+01	NSV		NA	NA	No	NSV
	7440-39-3	Barium	1.5E+01		9.6E+02	J	ug/L	WBP-99-5	8 / 8	1.8 - 1.8	9.6E+02	4.3E+02	NSV		NA	NA	No	NSV
	7440-43-9	Cadmium	6.3E-01		6.3E-01		ug/L	WBP-TTMW-03	1 / 8	0.4 - 0.4	6.3E-01	5.0E+00	NSV		NA	NA	No	NSV
	7439-92-1	Lead	1.1E+00	J	1.2E+00	J	ug/L	WBP-MW9	2 / 8	1 - 2	1.2E+00	1.8E+01	NSV		NA	NA	No	NSV
	7782-49-2	Selenium	2.8E+00	J	2.8E+00	J	ug/L	WBP-TTMW-06	1 / 8	2 - 4	2.8E+00	1.0E+01	NSV		NA	NA	No	NSV
	91-20-3	Naphthalene	2.7E-01	J	3.2E+00	J	ug/L	WBP-99-5	4 / 25	0.22 - 80	3.2E+00	NA	1.1E+01	CA	NA	NA	No	BSL
	71-55-6	1,1,1-Trichloroethane	1.8E-01	J	6.5E-01	J	ug/L	WBP-TTMW-11	3 / 25	0.16 - 40	6.5E-01	NA	1.2E+03	NC	NA	NA	No	BSL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	8.4E-01	J	1.8E+05	J	ug/L	WBP-99-6	19 / 25	0.18 - 800	1.8E+05	NA	3.8E+01	NC	NA	NA	Yes	ASL
	75-34-3	1,1-Dichloroethane	3.6E-01	J	3.5E+00	J	ug/L	WBP-TTMW-11	5 / 25	0.22 - 80	3.5E+00	NA	1.2E+01	CA	NA	NA	No	BSL
	75-35-4	1,1-Dichloroethene	2.4E-01	J	7.9E+01	J	ug/L	WBP-99-2	8 / 25	0.23 - 32	7.9E+01	NA	3.0E+01	NC	NA	NA	Yes	ASL
	95-63-6	1,2,4-Trimethylbenzene	1.5E-01	J	3.9E+00	J	ug/L	WBP-99-6	5 / 25	0.15 - 40	3.9E+00	NA	5.4E+01	NC	NA	NA	No	BSL
	108-67-8	1,3,5-Trimethylbenzene	5.8E-01	J	1.3E+00	J	ug/L	WBP-99-6	3 / 25	0.16 - 40	1.3E+00	NA	3.8E+01	NC	NA	NA	No	BSL
	544-10-5	1-Chlorohexane	3.1E-01	J	3.1E-01	J	ug/L	WBP-MW9	1 / 25	0.19 - 40	3.1E-01	NA	NTX		NA	NA	No	NTX
	99-87-6	4-Isopropyltoluene	5.6E-01	J	7.0E-01	J	ug/L	WBP-99-6	3 / 25	0.2 - 40	7.0E-01	NA	NTX		NA	NA	No	NTX
	67-64-1	Acetone	7.8E+00	J	4.7E+02	J	ug/L	WBP-99-2	5 / 25	1.9 - 260	4.7E+02	NA	NTX		NA	NA	No	NTX
	71-43-2	Benzene	1.7E-01	J	4.7E-01	J	ug/L	WBP-99-6	4 / 25	0.16 - 40	4.7E-01	NA	2.7E+00	CA	NA	NA	No	BSL
	74-83-9	Bromomethane	1.3E+00	J	8.4E+00	J	ug/L	WBP-TTMW-11	3 / 25	0.21 - 80	8.4E+00	NA	2.5E+00	NC	NA	NA	Yes	ASL
	75-15-0	Carbon disulfide	2.1E-01	J	6.8E+01	J	ug/L	WBP-99-6	2 / 25	0.17 - 80	6.8E+01	NA	1.9E+02	NC	NA	NA	No	BSL
	74-87-3	Chloro methane	2.9E+00	J	6.2E+00	J	ug/L	WBP-TTMW-11	2 / 25	0.8 - 80	6.2E+00	NA	3.5E+01	NC	NA	NA	No	BSL
	67-66-3	Chloroform	1.6E-01	J	2.1E+01	J	ug/L	WBP-99-2	6 / 25	0.16 - 16	2.1E+01	NA	1.3E+00	CA	NA	NA	Yes	ASL
	156-59-2	cis-1,2-Dichloroethene	3.5E-01	J	5.7E+01	J	ug/L	WBP-TTMW-11	7 / 25	0.15 - 40	5.7E+01	NA	4.2E+01	NC	NA	NA	Yes	ASL
	75-71-8	Dichlorodifluoromethane	3.3E-01	J	2.3E+02		ug/L	WBP-TTMW-01	9 / 25	0.31 - 80	2.3E+02	NA	9.6E-01	NC	NA	NA	Yes	ASL

TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current (Site Worker) and Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
	100-41-4	Ethyl- benzene	4.3E-01	J	1.9E+00	J	ug/L	WBP-99-6	3 / 25	0.16 - 40	1.9E+00	NA	6.9E+00	CA	NA	NA	No	BSL
	98-82-8	Isopropylbenzene	2.2E-01	J	3.6E-01	J	ug/L	WBP-99-6	2 / 25	0.19 - 40	3.6E-01	NA	2.1E+02	NC	NA	NA	No	BSL
	78-93-3	Methyl ethyl ketone	8.1E+00	J	8.1E+00	J	ug/L	WBP-99-5	1 / 25	4 - 400	8.1E+00	NA	3.9E+05	NC	NA	NA	No	BSL
	104-51-8	N-Butylbenzene	6.7E-01	J	9.3E-01	J	ug/L	WBP-99-6	3 / 25	0.14 - 80	9.3E-01	NA	NTX		NA	NA	No	NTX
	103-65-1	N-Propylbenzene	2.3E-01	J	6.1E-01	J	ug/L	WBP-99-6	3 / 25	0.16 - 40	6.1E-01	NA	5.2E+02	NC	NA	NA	No	BSL
	135-98-8	sec-Butylbenzene	4.9E-01	J	6.9E-01	J	ug/L	WBP-99-6	3 / 25	0.17 - 40	6.9E-01	NA	NTX		NA	NA	No	NTX
	108-88-3	Toluene	4.1E-01	J	8.1E+00	J	ug/L	WBP-99-6	5 / 25	0.17 - 40	8.1E+00	NA	3.5E+03	NC	NA	NA	No	BSL
	156-60-5	trans-1,2-Dichloroethene	5.0E-01	J	5.0E-01	J	ug/L	WBP-TTMW-11	1 / 25	0.15 - 40	5.0E-01	NA	1.8E+01	NC	NA	NA	No	BSL
	79-01-6	Trichloroethene	1.7E-01	J	5.4E+01	J	ug/L	WBP-TTMW-11	9 / 25	0.16 - 40	5.4E+01	NA	9.0E-01	NC	NA	NA	Yes	ASL
	XYLMP	Xylene, m,p-	2.4E-01	J	2.9E+00	J	ug/L	WBP-99-6	4 / 25	0.15 - 80	2.9E+00	NA	7.0E+01	NC	NA	NA	No	BSL
	95-47-6	Xylene, o-	2.5E-01	J	2.8E+00	J	ug/L	WBP-99-6	4 / 25	0.19 - 40	2.8E+00	NA	9.9E+01	NC	NA	NA	No	BSL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa* . Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Residential Groundwater Vapor Intrusion Screening Level (May 2023). Concentration based on site specific groundwater temperature of 13°C and non-carcinogenic health effects are based on HQ=0.1.

(4) Rationale Codes:

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Not Sufficiently Volatile (NSV)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
DNX = 1,3-Dinitro-5-nitroso-1,3,5-triazinane
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
nc = noncarcinogenic
RDX = Royal De µg/L= microgram per liter
TNX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater in a Trench

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
Groundwater Shallow Groundwater/Vapors (in a Trench) West Burn Pads Area	99-65-0	1,3-Dinitrobenzene	2.8E+00	J	2.8E+00	J	ug/L	WBP-TTMW-11	1 / 15	0.2 - 0.21	2.8E+00	NA	2.0E-01	nc	NA	NA	Yes	ASL
	606-20-2	2,6-Dinitrotoluene	1.0E+00	J	1.0E+00	J	ug/L	WBP-TTMW-11	1 / 15	0.2 - 0.21	1.0E+00	NA	4.9E-02	ca	NA	NA	Yes	ASL
	35572-78-2	2-Amino-4,6-dinitrotoluene	4.2E-01	J	5.1E-01	J	ug/L	WBP-TTMW-02	2 / 15	0.12 - 0.13	5.1E-01	NA	1.9E-01	nc	NA	NA	Yes	ASL
	19406-51-0	4-Amino-2,6-dinitrotoluene	1.1E-01	J	1.1E+00	J	ug/L	WBP-TTMW-02	5 / 15	0.058 - 0.13	1.1E+00	NA	1.9E-01	nc	NA	NA	Yes	ASL
	DNX	DNX	1.8E-01	J	3.6E+01	J	ug/L	WBP-TTMW-11	6 / 15	0.096 - 0.26	3.6E+01	NA	NTX		NA	NA	No	NTX
	2691-41-0	HMX	5.5E-01	J	4.5E+02		ug/L	JAW-23	11 / 15	0.2 - 20	4.5E+02	NA	1.0E+02	nc	4.0E+02	LHA	Yes	ASL
	5755-27-1	MNX	3.1E-01	J	3.3E+01	J	ug/L	WBP-TTMW-11	7 / 15	0.091 - 0.3	3.3E+01	NA	NTX		NA	NA	No	NTX
	121-82-4	RDX	5.1E-01		9.4E+02		ug/L	WBP-TTMW-11	8 / 15	0.39 - 39	9.4E+02	NA	9.7E-01	ca	2.0E+00	LHA	Yes	ASL
	479-45-8	Tetryl	1.7E+00	J	1.7E+00	J	ug/L	WBP-TTMW-11	1 / 15	0.2 - 0.21	1.7E+00	NA	3.9E+00	nc	NA	NA	No	BSL
	13980-04-6	TNX	2.3E+01	J	2.3E+01	J	ug/L	WBP-TTMW-11	1 / 15	0.25 - 0.26	2.3E+01	NA	NTX		NA	NA	No	NTX
	7440-39-3	Barium	1.5E+01		6.4E+02		ug/L	WBP-TTMW-03	5 / 5	1.8 - 1.8	6.4E+02	4.3E+02	3.8E+02	nc	2.0E+03	MCL	Yes	ASL
	7440-43-9	Cadmium	6.3E-01		6.3E-01		ug/L	WBP-TTMW-03	1 / 5	0.4 - 0.4	6.3E-01	5.0E+00	1.8E-01	nc	5.0E+00	MCL	Yes	ASL
	7439-92-1	Lead	1.1E+00	J	1.1E+00	J	ug/L	WBP-MW2	1 / 5	1 - 2	1.1E+00	1.8E+01	1.5E+01	L	1.5E+01	MCL	No	BSL
	91-20-3	Naphthalene	2.7E-01	J	2.7E-01	J	ug/L	WBP-TTMW-03	1 / 14	0.22 - 32	2.7E-01	NA	1.2E-01	ca	1.0E+02	LHA	Yes	ASL
	71-55-6	1,1,1-Trichloroethane	6.5E-01	J	6.5E-01	J	ug/L	WBP-TTMW-11	1 / 14	0.16 - 16	6.5E-01	NA	8.0E+02	nc	2.0E+02	MCL	No	BSL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	8.4E-01	J	2.8E+04	J	ug/L	WBP-TTMW-11	11 / 14	0.18 - 80	2.8E+04	NA	1.0E+03	nc	NA	NA	Yes	ASL
	75-34-3	1,1-Dichloroethane	3.6E-01	J	3.5E+00	J	ug/L	WBP-TTMW-11	3 / 14	0.22 - 32	3.5E+00	NA	2.8E+00	ca	NA	NA	Yes	ASL
	75-35-4	1,1-Dichloroethene	2.4E-01	J	2.9E+01		ug/L	WBP-TTMW-01	6 / 14	0.23 - 32	2.9E+01	NA	2.8E+01	nc	7.0E+00	MCL	Yes	ASL
	95-63-6	1,2,4-Trimethylbenzene	1.5E-01	J	2.9E-01	J	ug/L	WBP-TTMW-03	2 / 14	0.15 - 16	2.9E-01	NA	5.6E+00	nc	NA	NA	No	BSL
	67-64-1	Acetone	7.8E+00	J	9.2E+01		ug/L	WBP-TTMW-03	3 / 14	1.9 - 260	9.2E+01	NA	1.8E+03	nc	NA	NA	No	BSL
	71-43-2	Benzene	1.9E-01	J	2.1E-01	J	ug/L	WBP-TTMW-04	2 / 14	0.16 - 16	2.1E-01	NA	4.6E-01	ca	5.0E+00	MCL	No	BSL
	74-83-9	Bromomethane	8.4E+00	J	8.4E+00	J	ug/L	WBP-TTMW-11	1 / 14	0.8 - 32	8.4E+00	NA	7.5E-01	nc	NA	NA	Yes	ASL
	74-87-3	Chloro methane	6.2E+00	J	6.2E+00	J	ug/L	WBP-TTMW-11	1 / 14	0.8 - 32	6.2E+00	NA	1.9E+01	nc	NA	NA	No	BSL
	67-66-3	Chloroform	1.6E-01	J	2.2E+00	J	ug/L	WBP-TTMW-14	3 / 14	0.16 - 16	2.2E+00	NA	2.2E-01	ca	8.0E+01	MCL	Yes	ASL
	156-59-2	cis-1,2-Dichloroethene	3.5E-01	J	5.7E+01	J	ug/L	WBP-TTMW-11	5 / 14	0.15 - 16	5.7E+01	NA	2.5E+00	nc	7.0E+01	MCL	Yes	ASL
	75-71-8	Dichlorodifluoromethane	3.3E-01	J	2.3E+02		ug/L	WBP-TTMW-01	8 / 14	0.31 - 16	2.3E+02	NA	2.0E+01	nc	NA	NA	Yes	ASL
	108-88-3	Toluene	4.1E-01	J	3.1E+00		ug/L	WBP-TTMW-04	2 / 14	0.17 - 16	3.1E+00	NA	1.1E+02	nc	1.0E+03	MCL	No	BSL
	156-60-5	trans-1,2-Dichloroethene	5.0E-01	J	5.0E-01	J	ug/L	WBP-TTMW-11	1 / 14	0.15 - 16	5.0E-01	NA	6.8E+00	nc	1.0E+02	MCL	No	BSL
	79-01-6	Trichloroethene	1.7E-01	J	5.4E+01	J	ug/L	WBP-TTMW-11	6 / 14	0.16 - 16	5.4E+01	NA	2.8E-01	nc	5.0E+00	MCL	Yes	ASL
	XYLMP	Xylene, m,p-	2.4E-01	J	2.4E-01	J	ug/L	WBP-TTMW-03	1 / 14	0.15 - 32	2.4E-01	NA	1.9E+01	nc	NA	NA	No	BSL
	95-47-6	Xylene, o-	2.5E-01	J	2.5E-01	J	ug/L	WBP-TTMW-03	1 / 14	0.19 - 16	2.5E-01	NA	1.9E+01	nc	NA	NA	No	BSL

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater in a Trench

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Regional Screening Levels (RSL) for Tap Water (May 2023). Concentrations based on non-carcinogenic health effects are based on HQ=0.1.

(4) Values are the Federal Maximum Contaminant Levels (MCLs) and if no MCL was available, the EPA's (March 2018) Office of Water Lifetime Health Advisory (LHA) was provided.

(5) Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
DNX = 1,3-Dinitro-5-nitroso-1,3,5-triazinane
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
L = federal action level
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
nc = noncarcinogenic
RDX = Royal Demolition Explosive
TNX = Hexahydro-1,3,5-trinitroso-1,3,5-triazine
μg/L= microgram per liter

TABLE 3.1.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater (Plumes)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	RDX Plume EPC (1)		West VOC Plume EPC (2)		East VOC Plume EPC (3)		Final EPC (4)	
			Value	Statistic	Value	Statistic	Value	Statistic	Value	Statistic
Tapwater West Burn Pad Area Plumes	1,3-Dinitrobenzene	µg/L	2.8E+00	RDX Plume Max	2.8E+00	West VOC Plume Max	2.8E+00	Site-wide Max	2.8E+00	RDX Plume Max
	2,6-Dinitrotoluene	µg/L	1.0E+00	RDX Plume Max	1.0E+00	West VOC Plume Max	1.0E+00	Site-wide Max	1.0E+00	RDX Plume Max
	2-Amino-4,6-dinitrotoluene	µg/L	2.1E-01	95% KM (t) UCL	5.4E-01	Site-wide Max	5.4E-01	Site-wide Max	5.4E-01	Site-wide Max
	4-Amino-2,6-dinitrotoluene	µg/L	3.0E-01	95% KM (t) UCL	1.1E+00	Site-wide Max	1.1E+00	East VOC Plume Max	1.1E+00	East VOC Plume Max
	HMX	µg/L	1.5E+02	Gamma Adjusted KM-UCL	4.5E+02	West VOC Plume Max	4.5E+02	Site-wide Max	4.5E+02	West VOC Plume Max
	RDX	µg/L	2.8E+02	Gamma Adjusted KM-UCL	9.4E+02	West VOC Plume Max	9.4E+02	Site-wide Max	9.4E+02	West VOC Plume Max
	Arsenic	µg/L	3.7E+01	RDX Plume Max	3.7E+01	Site-wide Max	3.7E+01	East VOC Plume Max	3.7E+01	RDX Plume Max
	Barium	µg/L	9.6E+02	RDX Plume Max	9.6E+02	Site-wide Max	9.6E+02	East VOC Plume Max	9.6E+02	RDX Plume Max
	Cadmium	µg/L	6.3E-01	RDX Plume Max	6.3E-01	Site-wide Max	6.3E-01	East VOC Plume Max	6.3E-01	RDX Plume Max
	Naphthalene	µg/L	1.0E+00	95% KM (t) UCL	3.2E+00	Site-wide Max	3.2E+00	Site-wide Max	3.2E+00	Site-wide Max
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	6.0E+04	Gamma Adjusted KM-UCL	1.8E+05	West VOC Plume Max	1.8E+05	Site-wide Max	1.8E+05	West VOC Plume Max
	1,1-Dichloroethane	µg/L	1.1E+00	95% KM (t) UCL	3.5E+00	West VOC Plume Max	3.5E+00	Site-wide Max	3.5E+00	West VOC Plume Max
	1,1-Dichloroethene	µg/L	1.9E+01	95% KM (t) UCL	7.9E+01	Site-wide Max	7.9E+01	Site-wide Max	7.9E+01	Site-wide Max
	Benzene	µg/L	4.7E-01	RDX Plume Max	4.7E-01	West VOC Plume Max	4.7E-01	Site-wide Max	4.7E-01	RDX Plume Max
	Bromomethane	µg/L	8.4E+00	RDX Plume Max	8.4E+00	West VOC Plume Max	8.4E+00	Site-wide Max	8.4E+00	RDX Plume Max
	Chloroform	µg/L	7.8E+00	Gamma Adjusted KM-UCL	2.1E+00	West VOC Plume Max	2.1E+01	Site-wide Max	2.1E+01	West VOC Plume Max
	cis-1,2-Dichloroethene	µg/L	2.2E+01	Gamma Adjusted KM-UCL	5.7E+01	West VOC Plume Max	5.7E+01	Site-wide Max	5.7E+01	West VOC Plume Max
	Dichlorodifluoromethane	µg/L	5.5E+01	95% KM (t) UCL	2.3E+02	Site-wide Max	2.3E+02	East VOC Plume Max	2.3E+02	East VOC Plume Max
	Ethylbenzene	µg/L	1.9E+00	RDX Plume Max	1.9E+00	West VOC Plume Max	1.9E+00	Site-wide Max	1.9E+00	RDX Plume Max
	Trichloroethene	µg/L	2.1E+01	Gamma Adjusted KM-UCL	5.4E+01	West VOC Plume Max	5.4E+01	Site-wide Max	5.4E+01	West VOC Plume Max

Notes:
(1) Determination of EPCs for the COPCs within the RDX Plume are provide in Table 3.1.RME Supplement A
(2) Determination of EPCs for the COPCs within the West VOC Plume are provide in Table 3.1.RME Supplement B.
(3) Determination of EPCs for the COPCs within the East VOC Plume are provide in Table 3.1.RME Supplement C.
(4) The Final EPCs for Groundwater (Potable Use) are the highest EPC from the RDX, West VOC, and East VOC Plumes or the site-wide maximum detected concentration*.
*If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the RDX or VOC plumes, the maximum detected concentration of the COPC in the site-wide groundwater data set was used.

Statistics:
Gamma Adjusted KM-UCL: UCL based on Kaplan-Meier estimates adjusted assuming gamma distribution
KM (t): UCL based on Kaplan-Meier estimates using the Student's t-distribution critical value

Acronyms:
EPC = Exposure Point Concentration
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.1.RME SUPPLEMENT A
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater (RDX Plume)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale
Tapwater	1,3-Dinitrobenzene	µg/L	2.2E-01	NA	2.8E+00 J	2.8E+00	µg/L	RDX Plume Max	1
West Burn Pad Area	2,6-Dinitrotoluene	µg/L	1.5E-01	NA	1.0E+00 J	1.0E+00	µg/L	RDX Plume Max	1
RDX Plume	2-Amino-4,6-dinitrotoluene	µg/L	1.4E-01	2.1E-01	5.4E-01	2.1E-01	µg/L	95% KM (t) UCL	2
	4-Amino-2,6-dinitrotoluene	µg/L	1.9E-01	3.0E-01	1.1E+00 J	3.0E-01	µg/L	95% KM (t) UCL	2
	HMX	µg/L	6.5E+01	1.5E+02 G	4.5E+02	1.5E+02	µg/L	Gamma Adjusted KM-UCL	3
	RDX	µg/L	6.8E+01	2.8E+02 G	9.4E+02	2.8E+02	µg/L	Gamma Adjusted KM-UCL	3
	Arsenic	µg/L	9.5E+00	NA	3.7E+01	3.7E+01	µg/L	RDX Plume Max	1
	Barium	µg/L	3.5E+02	NA	9.6E+02 J	9.6E+02	µg/L	RDX Plume Max	1
	Cadmium	µg/L	6.3E-01	NA	6.3E-01	6.3E-01	µg/L	RDX Plume Max	1
	Naphthalene	µg/L	4.1E+00	1.0E+00	3.2E+00 J	1.0E+00	µg/L	95% KM (t) UCL	2
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	1.7E+04	6.0E+04 G	1.8E+05 J	6.0E+04	µg/L	Gamma Adjusted KM-UCL	3
	1,1-Dichloroethane	µg/L	4.1E+00	1.1E+00	3.5E+00 J	1.1E+00	µg/L	95% KM (t) UCL	2
	1,1-Dichloroethene	µg/L	1.0E+01	1.9E+01	7.9E+01 J	1.9E+01	µg/L	95% KM (t) UCL	2
	Benzene	µg/L	2.0E+00	NA	4.7E-01 J	4.7E-01	µg/L	RDX Plume Max	1
	Bromomethane	µg/L	4.5E+00	NA	8.4E+00 J	8.4E+00	µg/L	RDX Plume Max	1
	Chloroform	µg/L	2.0E+00	7.8E+00	2.1E+01 J	7.8E+00	µg/L	Gamma Adjusted KM-UCL	3
	cis-1,2-Dichloroethene	µg/L	5.5E+00	2.2E+01	5.7E+01 J	2.2E+01	µg/L	Gamma Adjusted KM-UCL	3
	Dichlorodifluoromethane	µg/L	3.0E+01	5.5E+01	2.3E+02	5.5E+01	µg/L	95% KM (t) UCL	2
	Ethyl- benzene	µg/L	2.1E+00	NA	1.9E+00 J	1.9E+00	µg/L	RDX Plume Max	1
	Trichloroethene	µg/L	5.5E+00	2.1E+01	5.4E+01 J	2.1E+01	µg/L	Gamma Adjusted KM-UCL	3

TABLE 3.1.RME SUPPLEMENT A
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater (RDX Plume)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale

Notes:
EPA's ProUCL software (June 2016, Version 5.1.002) used to determine distribution of data (normal, lognormal, gamma distribution, or nonparametric) and estimate upper confidence limits (UCLs).
* Arithmetic mean of detected concentrations are presented.
** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the RDX plume: JAW-23, JAW-25, JAW-68, WBP-99-1, WBP-99-2, WBP-99-4, WBP-99-5, WBP-99-6, WBP-MW1, WBP-MW3, WBP-MW6, WBP-MW8, WBP-MW9, WBP-TTMW-01, WBP-TTMW-02, WBP-TTMW-03, WBP-TTMW-05B, WBP-TTMW-06, WBP-TTMW-11, WBP-TTMW-12, WBP-TTMW-14, and WBP-TTMW-15.
If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the RDX plume, the maximum detected concentration of the COPC in the site-wide groundwater data set was used.

Statistics:
Gamma Adjusted KM-UCL: UCL based on Kaplan-Meier estimates adjusted assuming gamma distribution
KM (t): UCL based on Kaplan-Meier estimates using the Student's t-distribution critical value

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.
(2) Distribution tests are inconclusive; therefore, the nonparametric UCL was used as the EPC.
(3) Anderson-Darling and/or Kolmogorov-Smirnov Tests indicate data are gamma distributed.

Acronyms:
EPC = Exposure Point Concentration
G = Gamma distribution
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.1.RME SUPPLEMENT B
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater (West VOC Plume)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)		Exposure Point Concentration **			
							Value	Units	Statistic	Rationale
Tapwater West Burn Pad Area West VOC Plume	1,3-Dinitrobenzene	µg/L	2.2E-01	NA	2.8E+00	J	2.8E+00	µg/L	West VOC Plume Max	1
	2,6-Dinitrotoluene	µg/L	1.5E-01	NA	1.0E+00	J	1.0E+00	µg/L	West VOC Plume Max	1
	2-Amino-4,6-dinitrotoluene	µg/L	1.2E-01	NA	5.4E-01		5.4E-01	µg/L	Site-wide Max	1
	4-Amino-2,6-dinitrotoluene	µg/L	1.6E-01	NA	1.1E+00	J	1.1E+00	µg/L	Site-wide Max	1
	HMX	µg/L	6.5E+01	NA	4.5E+02		4.5E+02	µg/L	West VOC Plume Max	1
	RDX	µg/L	6.8E+01	NA	9.4E+02		9.4E+02	µg/L	West VOC Plume Max	1
	Arsenic	µg/L	8.1E+00	NA	3.7E+01		3.7E+01	µg/L	Site-wide Max	1
	Cadmium	µg/L	6.3E-01	NA	6.3E-01		6.3E-01	µg/L	Site-wide Max	1
	Barium	µg/L	2.8E+02	NA	9.6E+02	J	9.6E+02	µg/L	Site-wide Max	1
	Naphthalene	µg/L	3.2E+00	NA	3.2E+00	J	3.2E+00	µg/L	Site-wide Max	1
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	1.7E+04	NA	1.8E+05	J	1.8E+05	µg/L	West VOC Plume Max	1
	1,1-Dichloroethane	µg/L	4.1E+00	NA	3.5E+00	J	3.5E+00	µg/L	West VOC Plume Max	1
	1,1-Dichloroethene	µg/L	7.9E+00	NA	7.9E+01	J	7.9E+01	µg/L	Site-wide Max	1
	Benzene	µg/L	2.0E+00	NA	4.7E-01	J	4.7E-01	µg/L	West VOC Plume Max	1
	Bromomethane	µg/L	4.5E+00	NA	8.4E+00	J	8.4E+00	µg/L	West VOC Plume Max	1
	Chloroform	µg/L	2.0E+00	NA	2.1E+00	J	2.1E+00	µg/L	West VOC Plume Max	1
	cis-1,2-Dichloroethene	µg/L	5.5E+00	NA	5.7E+01	J	5.7E+01	µg/L	West VOC Plume Max	1
	Dichlorodifluoromethane	µg/L	2.7E+01	NA	2.3E+02		2.3E+02	µg/L	Site-wide Max	1
	Ethyl- benzene	µg/L	2.1E+00	NA	1.9E+00	J	1.9E+00	µg/L	West VOC Plume Max	1
	Trichloroethene	µg/L	5.5E+00	NA	5.4E+01	J	5.4E+01	µg/L	West VOC Plume Max	1

TABLE 3.1.RME SUPPLEMENT B
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater (West VOC Plume)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale

Notes:

* Arithmetic mean of detected concentrations are presented.

** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the West VOC plume: WBP-99-6, WBP-MW6, WBP-MW9, WBP-TTMW-05B, WBP-TTMW-06, WBP-TTMW-11, and JAW-23.
If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the VOC plume, the maximum detected concentration of the COPC in the site-wide groundwater data set was used.

Rationale:

(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.

Acronyms:

EPC = Exposure Point Concentration
G = Gamma distribution
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.1.RME SUPPLEMENT C
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater (East VOC Plume)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)		Exposure Point Concentration **			
							Value	Units	Statistic	Rationale
Tapwater West Burn Pad Area East VOC Plume	1,3-Dinitrobenzene	µg/L	1.9E-01	NA	2.8E+00	J	2.8E+00	µg/L	Site-wide Max	1
	2,6-Dinitrotoluene	µg/L	1.4E-01	NA	1.0E+00	J	1.0E+00	µg/L	Site-wide Max	1
	2-Amino-4,6-dinitrotoluene	µg/L	1.2E-01	NA	5.4E-01		5.4E-01	µg/L	Site-wide Max	1
	4-Amino-2,6-dinitrotoluene	µg/L	3.1E-01	NA	1.1E+00	J	1.1E+00	µg/L	East Plume Max	1
	HMX	µg/L	5.0E+01	NA	4.5E+02		4.5E+02	µg/L	Site-wide Max	1
	RDX	µg/L	5.2E+01	NA	9.4E+02		9.4E+02	µg/L	Site-wide Max	1
	Arsenic	µg/L	1.5E+01	NA	3.7E+01		3.7E+01	µg/L	East Plume Max	1
	Cadmium	µg/L	6.3E-01	NA	6.3E-01		6.3E-01	µg/L	East Plume Max	1
	Barium	µg/L	5.4E+02	NA	9.6E+02	J	9.6E+02	µg/L	East Plume Max	1
	Naphthalene	µg/L	3.2E+00	NA	3.2E+00	J	3.2E+00	µg/L	Site-wide Max	1
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	1.3E+04	NA	1.8E+05	J	1.8E+05	µg/L	Site-wide Max	1
	1,1-Dichloroethane	µg/L	3.2E+00	NA	3.5E+00	J	3.5E+00	µg/L	Site-wide Max	1
	1,1-Dichloroethene	µg/L	7.9E+00	NA	7.9E+01	J	7.9E+01	µg/L	Site-wide Max	1
	Benzene	µg/L	1.5E+00	NA	4.7E-01	J	4.7E-01	µg/L	Site-wide Max	1
	Bromomethane	µg/L	3.5E+00	NA	8.4E+00	J	8.4E+00	µg/L	Site-wide Max	1
	Chloroform	µg/L	1.6E+00	NA	2.1E+01	J	2.1E+01	µg/L	Site-wide Max	1
	cis-1,2-Dichloroethene	µg/L	4.3E+00	NA	5.7E+01	J	5.7E+01	µg/L	Site-wide Max	1
	Dichlorodifluoromethane	µg/L	1.1E+02	NA	2.3E+02		2.3E+02	µg/L	East Plume Max	1
	Ethyl- benzene	µg/L	1.6E+00	NA	1.9E+00	J	1.9E+00	µg/L	Site-wide Max	1
	Trichloroethene	µg/L	4.3E+00	NA	5.4E+01	J	5.4E+01	µg/L	Site-wide Max	1

Notes:
* Arithmetic mean of detected concentrations are presented.
** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the East VOC plume: WBP-99-5, WBP-MW1, WBP-TTMW-01, WBP-TTMW-02, and WBP-TTMW-03.
If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the VOC plume, the maximum detected concentration of the COPC in the site-wide groundwater data set was used.

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.

Acronyms:
EPC = Exposure Point Concentration
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.2.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current (Site Worker) and Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Indoor Air (Vapor Intrusion) West Burn Pad Area	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	1.3E+04	NA	1.8E+05	J	1.8E+05	µg/L	Sitewide Max	1
	1,1-Dichloroethene	µg/L	7.9E+00	NA	7.9E+01	J	7.9E+01	µg/L	Sitewide Max	1
	Bromomethane	µg/L	3.5E+00	NA	8.4E+00	J	8.4E+00	µg/L	Sitewide Max	1
	Chloroform	µg/L	1.6E+00	NA	2.1E+01	J	2.1E+01	µg/L	Sitewide Max	1
	cis-1,2-Dichloroethene	µg/L	1.0E+01	NA	5.7E+01	J	5.7E+01	µg/L	Sitewide Max	1
	Dichlorodifluoromethane	µg/L	2.7E+01	NA	2.3E+02		2.3E+02	µg/L	Sitewide Max	1
	Trichloroethene	µg/L	4.3E+00	NA	5.4E+01	J	5.4E+01	µg/L	Sitewide Max	1

Notes:
Statistics: Max - Maximum Detected Value

* Arithmetic mean of detected concentrations are presented.

(1) The maximum detected concentration was used as the EPC to evaluate the vapor intrusion pathway.

EPC = Exposure Point Concentration
J = result is estimated
NA = not applicable
UCL = Upper Confidence Limit
µg/L = microgram per liter

TABLE 3.2.RME SUPPLEMENT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current (Site Worker) and Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	Chemical of Potential Concern (1)	Exposure Point Concentration in Groundwater		Exposure Point Concentration in Indoor Air	
		Value (2)	Units	Value (3)	Units
Indoor Air (Vapor Intrusion) West Burn Pad Area	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	µg/L	2.5E+06	µg/m^3
	1,1-Dichloroethene	7.9E+01	µg/L	5.6E+01	µg/m^3
	Bromomethane	8.4E+00	µg/L	1.8E+00	µg/m^3
	Chloroform	2.1E+01	µg/L	1.9E+00	µg/m^3
	cis-1,2-Dichloroethene	5.7E+01	µg/L	5.7E+00	µg/m^3
	Dichlorodifluoromethane	2.3E+02	µg/L	2.5E+03	µg/m^3
	Trichloroethene	5.4E+01	µg/L	1.3E+01	µg/m^3

Notes:

(1) Chemicals of Potential Concern from Table 2.2.RME.

(2) Selection of exposure point concentration from Table 3.2.RME.

(3) The indoor air concentrations for groundwater-to-indoor air were estimated using the EPA's VISL Calculator, May 2023.
Site-specific groundwater temperature of 13 degrees C used to estimate indoor air concentrations.

µg/L = microgram per liter
µg/m^3 = microgram per cubic meter

TABLE 3.3.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater (Plumes)
Exposure Medium: Shallow Groundwater/Trench Air

Exposure Point	Chemical of Potential Concern	Units	RDX Plume EPC (1)		West VOC Plume (2)		East VOC Plume (3)		Final EPC (4)	
			Value	Statistic	Value	Statistic	Value	Statistic	Value	Statistic
Shallow Groundwater in Trench/ Vapors in a Trench West Burn Pad Area Plumes	1,3-Dinitrobenzene	µg/L	2.8E+00	RDX Plume Max	2.8E+00	West VOC Plume Max	2.8E+00	Site-wide Max	2.8E+00	RDX Plume Max
	2,6-Dinitrotoluene	µg/L	1.0E+00	RDX Plume Max	1.0E+00	West VOC Plume Max	1.0E+00	Site-wide Max	1.0E+00	RDX Plume Max
	2-Amino-4,6-dinitrotoluene	µg/L	5.1E-01	RDX Plume Max	5.1E-01	Site-wide Max	5.1E-01	East VOC Plume Max	5.1E-01	RDX Plume Max
	4-Amino-2,6-dinitrotoluene	µg/L	5.2E-01	95% KM (t) UCL	1.1E+00	Site-wide Max	1.1E+00	East VOC Plume Max	1.1E+00	East VOC Plume Max
	HMX	µg/L	2.4E+02	95% KM (t) UCL	4.5E+02	West VOC Plume Max	4.5E+02	Site-wide Max	4.5E+02	West VOC Plume Max
	RDX	µg/L	9.4E+02	RDX Plume Max	9.4E+02	West VOC Plume Max	9.4E+02	Site-wide Max	9.4E+02	RDX Plume Max
	Barium	µg/L	6.4E+02	RDX Plume Max	6.4E+02	Site-wide Max	6.4E+02	East VOC Plume Max	6.4E+02	RDX Plume Max
	Cadmium	µg/L	6.3E-01	RDX Plume Max	6.3E-01	Site-wide Max	6.3E-01	East VOC Plume Max	6.3E-01	RDX Plume Max
	Naphthalene	µg/L	2.7E-01	RDX Plume Max	2.7E-01	Site-wide Max	2.7E-01	East VOC Plume Max	2.7E-01	RDX Plume Max
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	2.8E+04	RDX Plume Max	2.8E+04	West VOC Plume Max	2.8E+04	Site-wide Max	2.8E+04	West VOC Plume Max
	1,1-Dichloroethane	µg/L	3.5E+00	RDX Plume Max	3.5E+00	West VOC Plume Max	3.5E+00	Site-wide Max	3.5E+00	RDX Plume Max
	1,1-Dichloroethene	µg/L	2.9E+01	RDX Plume Max	2.9E+01	Site-wide Max	2.9E+01	East VOC Plume Max	2.9E+01	RDX Plume Max
	Bromomethane	µg/L	8.4E+00	RDX Plume Max	8.4E+00	West VOC Plume Max	8.4E+00	Site-wide Max	8.4E+00	RDX Plume Max
	Chloroform	µg/L	2.2E+00	RDX Plume Max	2.2E+00	Site-wide Max	2.2E+00	Site-wide Max	2.2E+00	RDX Plume Max
	cis-1,2-Dichloroethene	µg/L	5.7E+01	RDX Plume Max	5.7E+01	West VOC Plume Max	5.7E+01	Site-wide Max	5.7E+01	RDX Plume Max
	Dichlorodifluoromethane	µg/L	1.1E+02	95% KM (t) UCL	2.3E+02	Site-wide Max	2.3E+02	East VOC Plume Max	2.3E+02	East VOC Plume Max
	Trichloroethene	µg/L	5.4E+01	RDX Plume Max	5.4E+01	West VOC Plume Max	5.4E+01	Site-wide Max	5.4E+01	RDX Plume Max

Notes:
(1) Determination of EPCs for the COPCs within the RDX Plume are provide in Table 3.3.RME Supplement B
(2) Determination of EPCs for the COPCs within the West VOC Plume are provide in Table 3.3.RME Supplement C
(3) Determination of EPCs for the COPCs within the East VOC Plume are provide in Table 3.3.RME Supplement D
(4) The Final EPCs for Groundwater (Potable Use) are the highest EPC from the RDX, West VOC, and East VOC Plumes or the site-wide maximum detected concentration*.
*If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the RDX or VOC plumes, the maximum detected concentration of the COPC in the site-wide groundwater data set was used.

Statistics:
KM (t): UCL based on Kaplan-Meier estimates using the Student's t-distribution critical value

Acronyms:
EPC = Exposure Point Concentration
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.3 RME SUPPLEMENT A

Calculation of Constituent Concentrations in Air from Trench Water Using VDEQ Model

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Exposure-point concentrations (inhalation) for construction workers in a trench: Groundwater less than 10 feet deep (1)	CAS No.	Molecular Weight MWi g/mol	Henry's Law Constant Hi atm-m^3/mol	Gas-Phase Mass Transfer Coefficient KiG cm/s	Liquid-Phase Mass Transfer Coefficient KiL cm/s	Overall Mass Transfer Coefficient Ki cm/s	Concentration of Contaminant in Groundwater Cgw ug/L	Volatilization Factor VF L/m^3	Concentration of Contaminant in Trench Ctrench ug/m^3	Concentration of Contaminant in Trench Ctrench mg/m^3
Naphthalene	91-20-3	128.18	4.4E-04	4.3E-01	9.9E-04	8.7E-04	2.7E-01	6.5E+00	1.7E+00	1.7E-03
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	187.38	5.3E-01	3.7E-01	8.2E-04	8.2E-04	2.8E+04	6.0E+00	1.7E+05	1.7E+02
1,1-Dichloroethane	75-34-3	98.96	5.6E-03	4.6E-01	1.1E-03	1.1E-03	3.5E+00	8.2E+00	2.9E+01	2.9E-02
1,1-Dichloroethene	75-35-4	96.94	2.6E-02	4.7E-01	1.1E-03	1.1E-03	2.9E+01	8.3E+00	2.4E+02	2.4E-01
Bromomethane	74-83-9	94.94	7.3E-03	4.7E-01	1.1E-03	1.1E-03	8.4E+00	8.4E+00	7.0E+01	7.0E-02
Chloroform	67-66-3	119.38	3.7E-03	4.4E-01	1.0E-03	1.0E-03	2.2E+00	7.4E+00	1.6E+01	1.6E-02
cis-1,2-Dichloroethene	156-59-2	96.94	4.1E-03	4.7E-01	1.1E-03	1.1E-03	5.7E+01	8.3E+00	4.7E+02	4.7E-01
Dichlorodifluoromethane	75-71-8	120.91	3.4E-01	4.3E-01	1.0E-03	1.0E-03	1.1E+02	7.5E+00	7.9E+02	7.9E-01
Trichloroethene	79-01-6	131.39	9.9E-03	4.2E-01	9.7E-04	9.7E-04	5.4E+01	7.1E+00	3.9E+02	3.9E-01

(1) Site-specific.

VDEQ. Virginia Unified Risk Assessment Model. Appendix 3 Construction Worker Groundwater Trench Model. 2018.

$C_{trench} = C_{GW} \times VF$

C_{trench} = concentration of contaminant in the trench (ug/m^3)

C_{GW} = concentration of contaminant in groundwater (ug/L)

VF = volatilization factor (L/m^3)

TABLE 3.3 RME SUPPLEMENT A

Calculation of Constituent Concentrations in Air from Trench Water Using VDEQ Model

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

For Mass-Transfer Coefficients

Kg,H_2O	0.833	cm/s
MWH_2O	18	
Kl,O_2	0.002	cm/s
MWO_2	32	
T	**70**	F
T	294	K
R	8.20E-05	atm-m^3/mol-K

For Emission Flux and Concentration in Trench

CF1	1.00E-03	L/cm^3
CF2	1.00E+04	cm^2/m^2
CF3	3600	s/hr
F	**1**	
ACH	2	hr^{-1}

Trench dimensions

Length	**8**	ft
	2.44	m
Width	**2.99**	ft
	0.91	m
Depth	**8**	ft
	2.44	m
Width/Depth	0.37	

VF = (K_i x A x F x 10^{-3} x 10^4 x 3600) / (ACH x V)
K_i = overall mass transfer coefficient of contaminant (cm/sec)
A = area of trench (m^2)
F = fraction of floor through which contaminant can enter (unitless)
ACH = air changes per hour (h^{-1})
V = volume of trench (m^3)
10^{-3} = conversion factor (L/cm^3)
10^4 = conversion factor (cm^2/m^2)
3600 = conversion factor (sec/hr)

Ki = 1 / {(1/kiL) + [(R T) / (Hi k_{iG})]}
kiL = liquid-phase mass transfer coefficient of i (cm/sec)
R = ideal gas constant (8.2 x 10^{-5} atm-m^3/mole-K)
T = average system Fahrenheit (F); average site groundwater temperature (68 F or 20 Celsius).
T = average system absolute temperature (298 K)
Hi = Henry's Law constant of i (atm-m^3/mol) from EPA Regional Screening Levels tables (May 2023)
k_{ig} = gas-phase mass transfer coefficient of i (cm/sec)

kiL = (MWO_2/MWi)0.5 x (T/298) x kL,O_2 (cm/sec)
MWO_2 = molecular weight of O_2 (g/mol)
MWi = molecular weight of component i (g/mol)
kL, O_2 = liquid-phase mass transfer coefficient of oxygen at 25oC (0.002 cm/sec)

k_{iG} = (MWH_2O/MWi)0.335 x (T/298)1.005 x kG, H_2O (cm/s)
MWH_2O = molecular weight of water (g/mol)
k_g, H_2O = gas-phase mass transfer coefficient of water vapor at 25oC (0.833 cm/sec)

TABLE 3.3.RME SUPPLEMENT B
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater (RDX Plume)
Exposure Medium: Shallow Groundwater/Trench Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)		Exposure Point Concentration **			
							Value	Units	Statistic	Rationale
Shallow Groundwater in Trench/ Vapors in a Trench West Burn Pad Area RDX Plume	1,3-Dinitrobenzene	µg/L	4.0E-01	NA	2.8E+00	J	2.8E+00	µg/L	Plume Max	1
	2,6-Dinitrotoluene	µg/L	2.0E-01	NA	1.0E+00	J	1.0E+00	µg/L	Plume Max	1
	2-Amino-4,6-dinitrotoluene	µg/L	1.5E-01	NA	5.1E-01	J	5.1E-01	µg/L	Plume Max	1
	4-Amino-2,6-dinitrotoluene	µg/L	2.7E-01	5.2E-01	1.1E+00	J	5.2E-01	µg/L	95% KM (t) UCL	2
	HMX	µg/L	1.3E+02	2.4E+02	4.5E+02		2.4E+02	µg/L	95% KM (t) UCL	2
	RDX	µg/L	1.3E+02	1.9E+03	9.4E+02		9.4E+02	µg/L	Plume Max	3
	Barium	µg/L	3.1E+02	NA	6.4E+02		6.4E+02	µg/L	Plume Max	1
	Cadmium	µg/L	6.3E-01	NA	6.3E-01		6.3E-01	µg/L	RDX Plume Max	1
	Naphthalene	µg/L	3.4E+00	NA	2.7E-01	J	2.7E-01	µg/L	Plume Max	1
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	4.6E+03	3.0E+04	2.8E+04	J	2.8E+04	µg/L	Plume Max	3
	1,1-Dichloroethane	µg/L	3.7E+00	NA	3.5E+00	J	3.5E+00	µg/L	Plume Max	1
	1,1-Dichloroethene	µg/L	6.9E+00	NA	2.9E+01		2.9E+01	µg/L	Plume Max	1
	Bromomethane	µg/L	4.3E+00	NA	8.4E+00	J	8.4E+00	µg/L	Plume Max	1
	Chloroform	µg/L	1.4E+00	NA	2.2E+00	J	2.2E+00	µg/L	Plume Max	1
	cis-1,2-Dichloroethene	µg/L	8.0E+00	NA	5.7E+01	J	5.7E+01	µg/L	Plume Max	1
	Dichlorodifluoromethane	µg/L	5.1E+01	1.1E+02	2.3E+02		1.1E+02	µg/L	95% KM (t) UCL	2
	Trichloroethene	µg/L	7.7E+00	NA	5.4E+01	J	5.4E+01	µg/L	Plume Max	1

Notes:
EPA's ProUCL software (June 2016, Version 5.1.002) used to determine distribution of data (normal, lognormal, gamma distribution, or nonparametric) and estimate upper confidence limits (UCLs).
* Arithmetic mean of detected concentrations are presented.
** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the RDX plume: JAW-23, JAW-25, WBP-MW1, WBP-TTMW-01, WBP-TTMW-02, WBP-TTMW-03, WBP-TTMW-05B, WBP-TTMW-11, and WBP-TTMW-14.
If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the RDX plume, the maximum detected concentration of the COPC in the site-wide groundwater data set was used.

Statistics:
KM (t): UCL based on Kaplan-Meier estimates using the Student's t-distribution critical value

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.
(2) Distribution tests are inconclusive; therefore, the nonparametric UCL was used as the EPC.
(3) The maximum detected concentration was used as the EPC because the UCL exceeds the maximum.

Acronyms:
EPC = Exposure Point Concentration
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.3.RME SUPPLEMENT C
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater (West VOC Plume)
Exposure Medium: Shallow Groundwater/Trench Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)		Exposure Point Concentration **			
							Value	Units	Statistic	Rationale
Shallow Groundwater in Trench/ Vapors in a Trench West Burn Pad Area West VOC Plume	1,3-Dinitrobenzene	µg/L	1.0E+00	NA	2.8E+00	J	2.8E+00	µg/L	West VOC Plume Max	1
	2,6-Dinitrotoluene	µg/L	4.0E-01	NA	1.0E+00	J	1.0E+00	µg/L	West VOC Plume Max	1
	2-Amino-4,6-dinitrotoluene	µg/L	1.1E-01	NA	5.1E-01	J	5.1E-01	µg/L	Site-wide Max	1
	4-Amino-2,6-dinitrotoluene	µg/L	1.9E-01	NA	1.1E+00	J	1.1E+00	µg/L	Site-wide Max	1
	HMX	µg/L	1.8E+02	NA	4.5E+02		4.5E+02	µg/L	West VOC Plume Max	1
	RDX	µg/L	3.3E+02	NA	9.4E+02		9.4E+02	µg/L	West VOC Plume Max	1
	Barium	µg/L	2.2E+02	NA	6.4E+02		6.4E+02	µg/L	Site-wide Max	1
	Cadmium	µg/L	6.3E-01	NA	6.3E-01		6.3E-01	µg/L	Site-wide Max	1
	Naphthalene	µg/L	2.3E+00	NA	2.7E-01	J	2.7E-01	µg/L	Site-wide Max	1
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	9.3E+03	NA	2.8E+04	J	2.8E+04	µg/L	West VOC Plume Max	1
	1,1-Dichloroethane	µg/L	1.4E+00	NA	3.5E+00	J	3.5E+00	µg/L	West VOC Plume Max	1
	1,1-Dichloroethene	µg/L	4.9E+00	NA	2.9E+01		2.9E+01	µg/L	Site-wide Max	1
	Bromomethane	µg/L	3.1E+00	NA	8.4E+00	J	8.4E+00	µg/L	West VOC Plume Max	1
	Chloroform	µg/L	1.0E+00	NA	2.2E+00	J	2.2E+00	µg/L	Site-wide Max	1
	cis-1,2-Dichloroethene	µg/L	1.9E+01	NA	5.7E+01	J	5.7E+01	µg/L	West VOC Plume Max	1
	Dichlorodifluoromethane	µg/L	4.0E+01	NA	2.3E+02		2.3E+02	µg/L	Site-wide Max	1
	Trichloroethene	µg/L	1.8E+01	NA	5.4E+01	J	5.4E+01	µg/L	West VOC Plume Max	1

Notes:
* Arithmetic mean of detected concentrations are presented.
** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the West VOC plume: WBP-TTMW-05B, WBP-TTMW-11, and JAW-23.
If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the VOC plume, the maximum detected concentration of the COPC in the site-wide groundwater data set was used.

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.

Acronyms:
EPC = Exposure Point Concentration
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.3.RME SUPPLEMENT D
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater (East VOC Plume)
Exposure Medium: Shallow Groundwater/Trench Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale
Shallow Groundwater in Trench/ Vapors in a Trench West Burn Pad Area East VOC Plume	1,3-Dinitrobenzene	µg/L	2.8E-01	NA	2.8E+00 J	2.8E+00	µg/L	Site-wide Max	1
	2,6-Dinitrotoluene	µg/L	1.6E-01	NA	1.0E+00 J	1.0E+00	µg/L	Site-wide Max	1
	2-Amino-4,6-dinitrotoluene	µg/L	1.7E-01	NA	5.1E-01 J	5.1E-01	µg/L	East VOC Plume Max	1
	4-Amino-2,6-dinitrotoluene	µg/L	3.7E-01	NA	1.1E+00 J	1.1E+00	µg/L	East VOC Plume Max	1
	HMX	µg/L	8.1E+01	NA	4.5E+02	4.5E+02	µg/L	Site-wide Max	1
	RDX	µg/L	8.0E+01	NA	9.4E+02	9.4E+02	µg/L	Site-wide Max	1
	Barium	µg/L	3.3E+02	NA	6.4E+02	6.4E+02	µg/L	East VOC Plume Max	1
	Cadmium	µg/L	6.3E-01	NA	6.3E-01	6.3E-01	µg/L	East Plume Max	1
	Naphthalene	µg/L	6.2E+00	NA	2.7E-01 J	2.7E-01	µg/L	East VOC Plume Max	1
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	3.1E+03	NA	2.8E+04 J	2.8E+04	µg/L	Site-wide Max	1
	1,1-Dichloroethane	µg/L	2.5E+00	NA	3.5E+00 J	3.5E+00	µg/L	Site-wide Max	1
	1,1-Dichloroethene	µg/L	1.4E+01	NA	2.9E+01	2.9E+01	µg/L	East VOC Plume Max	1
	Bromomethane	µg/L	2.9E+00	NA	8.4E+00 J	8.4E+00	µg/L	Site-wide Max	1
	Chloroform	µg/L	1.0E+00	NA	2.2E+00 J	2.2E+00	µg/L	Site-wide Max	1
	cis-1,2-Dichloroethene	µg/L	5.3E+00	NA	5.7E+01 J	5.7E+01	µg/L	Site-wide Max	1
	Dichlorodifluoromethane	µg/L	1.1E+02	NA	2.3E+02	2.3E+02	µg/L	East VOC Plume Max	1
	Trichloroethene	µg/L	5.1E+00	NA	5.4E+01 J	5.4E+01	µg/L	Site-wide Max	1

Notes:
EPA's ProUCL software (June 2016, Version 5.1.002) used to determine distribution of data (normal, lognormal, gamma distribution, or nonparametric) and estimate upper confidence limits (UCLs).
* Arithmetic mean of detected concentrations are presented.
** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the East VOC plume: WBP-MW1, WBP-TTMW-01, WBP-TTMW-02, and WBP-TTMW-03.
If the maximum detected concentration of a groundwater COPC was not in the subset of wells from the core of the VOC plume, the maximum detected concentration of the COPC in the site-wide groundwater data set was used.

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.

Acronyms:
EPC = Exposure Point Concentration
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	2.5	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	0.78	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				BW	Body Weight	15	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W-Adj	Ingestion Rate of Water, Age-adjusted	0.94	liter-year/kg-day	Calculated	CW x IR-W-Adj x EF x CF1 x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	IR-W-Adj (liter-year/kd-day) =
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	(ED-C x IR-W-C / BW-C) + (ED-A x IR-W-A / BW-A)
	Site Worker	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	1	L/day	(5)	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 2014	
				ED	Exposure Duration	25	years	EPA, 2014	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

West Burn Pads Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	19,652	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.71	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	80	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,365	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.54	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

West Burn Pads Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) = DA-Adj x EF x EV x 1/AT
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	Calculated	mg-year/event-kg	Calculated	DA-Adj = (DAevent-A x SA-A x ED-A x 1/BW-A)
				EV	Event Frequency	1	events/day	EPA, 2004	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
	Site Worker	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	2,500	cm^2	EPA, 2014 (3)	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	EPA, 1991	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.2	hr/event	(4)	x CF1 x CF2
				EF	Exposure Frequency	250	days/year	EPA, 2014	
				ED	Exposure Duration	25	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	80	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.
(3) The SA for a site worker exposed to tap water is based on face, forearms, and hands.
(4) Based on best professional judgment (total of 12 minutes per day).
(5) March 1996 Interagency Agreement Dispute Resolution.

Sources:

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

cm/hr = Centimeter per hour
cm^2 = Square centimeter
mg/µg = Milligram per microgram
kg = Kilogram
L/cm^3 = Liter per cubic centimeter
L/day = Liter per day
mg/cm^2 -event = Milligram per square centimeter per event
mg/kg-day = Milligram per kilogram per day
µg/L = Microgram per liter

TABLE 4.2.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Household Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Hypothetical Resident	Adult	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	Exposure Concentration (EC) (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	
		Child	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	EC (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	
		Child/Adult Aggregate	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	EC (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:
EPA, 1991. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals). Office of Emergency and Remedial Response. EPA/540/R-92/003. December 1991.
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

L/m^3 = Liter per cubic meter
mg/m^3 = Milligram per cubic meter
µg/L = Microgram per liter

TABLE 4.3.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
REASONABLE MAXIMUM EXPOSURE
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current and Future
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Hypothetical Resident	Adult	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Indoor Air	See Table 3.2.RME Supp	mg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	20	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
		Child	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	See Table 3.2.RME Supp	mg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	6	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
		Child/Adult Aggregate	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	See Table 3.2.RME Supp	mg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration, Resident	26	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

REASONABLE MAXIMUM EXPOSURE

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current and Future
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
	Site Worker	Adult	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	See Table 3.2.RME Supp	mg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	8	hr/day	EPA, 2014	
				EF	Exposure Frequency	250	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	25	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

Notes:

(1) Calculated as the product of ED (years) x 365 days/year.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA, 2023: Vapor Intrusion Screening Levels (VISL) Calculator tool. May.

µg/L = microgram per liter

µg/m^3 = microgram per cubic meter

hr/day = hour per day

mg/m^3 = milligram per cubic meter

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

West Burn Pads Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction/Utility Worker	Adult	Shallow Groundwater in Trench	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/L	See Table 3.3.RME	Subchronic Daily Intake (SDI) (mg/kg-day) = CW x IR-W x EF x ED x ET x CF1 x 1/BW x 1/AT
				IR-W	Ingestion Rate of Water	0.0112	L/hour	EPA, 2019 (1)	
				EF	Exposure Frequency	250	days/year	(2)	
				ED	Exposure Duration	0.033	years	(2)	
				ET	Exposure Time	1	hour/day	(2)	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	12	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
Dermal	Construction/Utility Worker	Adult	Shallow Groundwater in Trench	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/L	See Table 3.3.RME	SDI (mg/kg-day) = DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	
				t_{event}	Event Time	1	hr/event	(2)	
				SA	Skin Surface Area Available for Contact	7,567	cm^2	EPA, 2011 (5)	Inorganics: DAevent (mg/cm^2-event) = Kp x CW x t_{event} x CF1 x CF2
				EV	Event Frequency	1	events/day	(2)	
				EF	Exposure Frequency	250	days/year	(2)	
				ED	Exposure Duration	0.033	years	(2)	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	12	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				FA	Fraction absorbed water	Chemical-Specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	Chemical-Specific	cm/hr	EPA, 2023	
				τ	Lag Time	Chemical-Specific	hr/event	EPA, 2023	
				t*	Time to Reach Steady-state	Chemical-Specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical-Specific	dimensionless	EPA, 2023	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

West Burn Pads Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:

(1) This value is the upper confidence limit on the mean water ingestion rate while splashing, which is the type of activity expected if a worker has contact with shallow groundwater while performing repairs or maintenance activities on a culvert [Table 3-96 of the Exposure Factors Handbook (EPA, 2019)].

(2) Professional judgment assuming a worker would have contact with shallow groundwater while performing repairs or maintenance activities on a culvert for 1 hour a day, 6 days a week for 2 weeks per year.

(3) Calculated as the product of ED (years) x 365 days/year.

(4) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

(5) Skin surface area in contact with shallow groundwater assumed to be head, hands, forearms, lower legs, and feet (EPA, 2011).

Sources:

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

EPA, 2011. Exposure Factors Handbook: 2011 Edition. EPA/600/R-090/052F. September 2011.

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-18/259F, 2019.

EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

cm/hr = Centimeter per hour
cm^2 = Square centimeter
mg/µg = Milligram per microgram
kg = Kilogram
L/cm^3 = Liter per cubic centimeter
L/day = Liter per day
mg/cm^2 -event = Milligram per square centimeter per event
mg/kg-day = Milligram per kilogram per day
µg/L = Microgram per liter

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

West Burn Pads Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Shallow Groundwater
Exposure Medium: Trench Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction/Utility Worker	Adult	Vapors in Trench	CW	Chemical Concentration in Water	See Table 3.3.RME Supp	µg/L	See Table 3.3.RME Supp	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	Calculated	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	1	hr/day	(1)	
				EF	Exposure Frequency	250	days/year	(1)	CA calculated using the Construction Worker
				ED	Exposure Duration	0.033	years	(1)	Groundwater Trench Model provided in the Virginia
				CF	Conversion Factor	1/24	day/hour	- -	Unified Risk Assessment Model User's Guide
				AT-N	Averaging Time (Non-Cancer)	12	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	

Notes:
(1) Professional judgment assuming a worker would have contact with shallow groundwater while performing repairs or maintenance activities on a culvert for 1 hour a day, 6 days a week for 2 weeks per year.
(2) Calculated as the product of ED (years) x 365 days/year.
(3) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.
Sources:
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

hr/day = hours per day
mg/m^3 = Milligram per cubic meter
µg/L = Microgram per liter

TABLE 4 RME SUPPLEMENT
RECEPTOR-SPECIFIC EXPOSURE FACTORS FOR HYPOTHETICAL RESIDENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pads Area
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor: Hypothetical Resident

					Water	
Age Group	Age-dependent Adjustment Factor (ADAF)	Exposure Frequency (EF)	Exposure Duration (ED)	Body Weight (BW)	Ingestion	IR-W-Adj
		(day/year)	(years)	(kg)	(L/day)	(L/kg)
Child (0-2)	10	350	2	15	0.78	364
Child (2-6)	3	350	4	15	0.78	218
Adolescent (6-16)	3	350	10	80	2.5	328
Adult (16-26)	1	350	10	80	2.5	109
Total			26			1,020

Equations
Ingestion (water): Total IR-W-Adj (MMOA) [L/kg} = Sum (ADAF x EF x ED x IR-S x 1/BW)

Sources:
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-18/259F, 2019.

MMOA - Mutagenic mode of action
ADAF - Age-dependent Adjustment Factor
kg = Kilogram
L/day = Liter per day

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

West Bun Pit Area

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,3-Dinitrobenzene	Chronic	1.0E-04	mg/kg-day	100%	1.0E-04	mg/kg-day	Immune	3000	IRIS	09/18/2023
1,3-Dinitrobenzene	Subchronic	5.0E-04	mg/kg-day	100%	5.0E-04	mg/kg-day	Hematologic	1000	ATSDR	06/01/1995
2,6-Dinitrotoluene	Chronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Spleen	10000	PPRTV X	04/10/2013
2,6-Dinitrotoluene	Subchronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Hematologic	1000	ATSDR	02/01/2016
2-Amino-4,6-dinitrotoluene	Chronic	1.0E-04	mg/kg-day	100%	1.0E-04	mg/kg-day	Hepatic	3000	PPRTV X	06/05/2020
2-Amino-4,6-dinitrotoluene	Subchronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Hepatic	1000	PPRTV X	06/05/2020
4-Amino-2,6-dinitrotoluene	Chronic	1.0E-04	mg/kg-day	100%	1.0E-04	mg/kg-day	Hepatic	3000	PPRTV X	06/05/2020
4-Amino-2,6-dinitrotoluene	Subchronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Hepatic	1000	PPRTV X	06/05/2020
HMX	Chronic	5.0E-02	mg/kg-day	100%	5.0E-02	mg/kg-day	Hepatic	1000	IRIS	09/18/2023
HMX	Subchronic	5.0E-02	mg/kg-day	100%	5.0E-02	mg/kg-day	Hepatic	1000	ATSDR	09/01/1997
RDX	Chronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Nervous	300	IRIS	09/18/2023
RDX	Subchronic	1.0E-01	mg/kg-day	100%	1.0E-01	mg/kg-day	Neurological	30	ATSDR	05/05/2021
Arsenic	Chronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Cardiovascular, Dermal	3	IRIS	09/18/2023
Arsenic	Subchronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Dermal	3	HEAST	07/31/1997
Barium	Chronic	2.0E-01	mg/kg-day	7%	1.4E-02	mg/kg-day	Urinary	300	IRIS	09/18/2023
Barium	Subchronic	2.0E-01	mg/kg-day	7%	1.4E-02	mg/kg-day	Urinary	300	ATSDR	05/05/2021
Cadmium (water)	Chronic	1.0E-04	mg/kg-day	5%	5.0E-06	mg/kg-day	Urinary	3	ATSDR	10/25/2022
Cadmium (water)	Subchronic	5.0E-04	mg/kg-day	5%	2.5E-05	mg/kg-day	Muscular	100	ATSDR	02/22/2022
Naphthalene	Chronic	2.0E-02	mg/kg-day	58-89%	2.0E-02	mg/kg-day	Whole body	3000	IRIS	09/18/2023
Naphthalene	Subchronic	6.0E-01	mg/kg-day	58-89%	6.0E-01	mg/kg-day	Nervous	90	ATSDR	05/05/2021
1,1,2-Trichlorotrifluoroethane (Freon 113)	Chronic	3.0E+01	mg/kg-day	100%	3.0E+01	mg/kg-day	Neurological	10	IRIS	09/18/2023
1,1,2-Trichlorotrifluoroethane (Freon 113)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	Chronic	2.0E-01	mg/kg-day	100%	2.0E-01	mg/kg-day	Urinary	3000	PPRTV	09/27/2006
1,1-Dichloroethane	Subchronic	2.0E+00	mg/kg-day	100%	2.0E+00	mg/kg-day	Urinary	300	PPRTV	09/27/2006
1,1-Dichloroethene	Chronic	5.0E-02	mg/kg-day	100%	5.0E-02	mg/kg-day	Hepatic	100	IRIS	09/18/2023
1,1-Dichloroethene	Subchronic	9.0E-03	mg/kg-day	100%	9.0E-03	mg/kg-day	Hepatic	1000	HEAST	07/31/1997
Benzene	Chronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Immune	300	IRIS	09/18/2023
Benzene	Subchronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Immune	100	PPRTV	09/29/2009
Bromomethane	Chronic	1.4E-03	mg/kg-day	100%	1.4E-03	mg/kg-day	Gastrointestinal	1000	IRIS	09/18/2023
Bromomethane	Subchronic	5.0E-03	mg/kg-day	100%	5.0E-03	mg/kg-day	Gastrointestinal	300	PPRTV	06/05/2007
Chloroform	Chronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Hepatic	100	IRIS	09/18/2023
Chloroform	Subchronic	1.0E-01	mg/kg-day	100%	1.0E-01	mg/kg-day	Hepatic	100	ATSDR	05/05/2021
cis-1,2-Dichloroethene	Chronic	2.0E-03	mg/kg-day	100%	2.0E-03	mg/kg-day	Urinary	3000	IRIS	09/18/2023
cis-1,2-Dichloroethene	Subchronic	2.0E-02	mg/kg-day	100%	2.0E-02	mg/kg-day	Urinary	300	PPRTV	02/03/2011
Dichlorodifluoromethane	Chronic	2.0E-01	mg/kg-day	100%	2.0E-01	mg/kg-day	Whole body	100	IRIS	09/18/2023

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

West Bun Pit Area

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Dichlorodifluoromethane	Subchronic	5.0E-02	mg/kg-day	100%	5.0E-02	mg/kg-day	Whole body	300	PPRTV	09/29/2010
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	100%	1.0E-01	mg/kg-day	Hepatic, Urinary	1000	IRIS	09/18/2023
Ethylbenzene	Subchronic	5.0E-02	mg/kg-day	100%	5.0E-02	mg/kg-day	Hepatic	1000	PPRTV	09/10/2009
Trichloroethene	Chronic	5.0E-04	mg/kg-day	100%	5.0E-04	mg/kg-day	Developmental, Cardiovascular, Immune	10 - 1000	IRIS	09/18/2023
Trichloroethene	Subchronic	5.0E-04	mg/kg-day	100%	5.0E-04	mg/kg-day	Developmental, Immune	10 - 1000	ATSDR	05/05/2021

Note:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) The RfD for xylenes was used for m,p-xylene and o-xylene.

Definitions:
ATSDR = Agency for Toxic Substances and Disease Registry
HEAST = Health Effects Summary Tables
IRIS = Integrated Risk Information System
NA = Not Available
NOE = No Observed Effect
PPRTV = Provisional Peer-Reviewed Toxicity Value
PPRTV X = PPRTV appendix screening toxicity value

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

West Bun Pit Area

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Naphthalene	Chronic	3.0E-03	mg/m^3	Nervous, Respiratory	3000	IRIS	09/18/2023
Naphthalene	Subchronic	NA	NA	NA	NA	NA	NA
1,1,2-Trichlorotrifluoroethane (Freon 113)	Chronic	5.0E+00	mg/m^3	NOE	300	PPRTV	09/26/2016
1,1,2-Trichlorotrifluoroethane (Freon 113)	Subchronic	5.0E+01	mg/m^3	NOE	30	PPRTV	09/26/2016
1,1-Dichloroethane	Chronic	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	Subchronic	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	Chronic	2.0E-01	mg/m^3	Hepatic	30	IRIS	09/18/2023
1,1-Dichloroethene	Subchronic	NA	NA	NA	NA	NA	NA
Benzene	Chronic	3.0E-02	mg/m^3	Immune	300	IRIS	09/18/2023
Benzene	Subchronic	8.0E-02	mg/m^3	Immune	100	PPRTV	09/29/2009
Bromomethane	Chronic	5.0E-03	mg/m^3	Nervous, Respiratory	100	IRIS	09/18/2023
Bromomethane	Subchronic	1.0E-01	mg/m^3	Respiratory	30	PPRTV	06/05/2007
Chloroform	Chronic	9.8E-02	mg/m^3	Hepatic	100	ATSDR	05/05/2021
Chloroform	Subchronic	2.4E-01	mg/m^3	Hepatic	300	ATSDR	05/05/2021
Dichlorodifluoromethane	Chronic	1.0E-01	mg/m^3	Whole Body	10000	PPRTV X	09/29/2010
Dichlorodifluoromethane	Subchronic	1.0E+00	mg/m^3	Whole Body	1000	PPRTV	09/29/2010
cis-1,2-Dichloroethene	Chronic	4.0E-02	mg/m^3	Immune	3000	PPRTV X	09/21/2022
cis-1,2-Dichloroethene	Subchronic	4.0E-01	mg/m^3	Immune	300	PPRTV X	09/21/2022
Ethylbenzene	Chronic	1.0E+00	mg/m^3	Developmental	300	IRIS	09/18/2023
Ethylbenzene	Subchronic	9.0E+00	mg/m^3	Ear	100	PPRTV	09/10/2009
Trichloroethene	Chronic	2.0E-03	mg/m^3	Developmental, Cardiovascular, Immune	10-100	IRIS	09/18/2023
Trichloroethene	Subchronic	2.0E-03	mg/m^3	Developmental, Immune	10-100	ATSDR	05/05/2021

Note:

(1) The RfC for xylenes was used for m,p-xylene and o-xylene.

Definitions:

ATSDR = Agency for Toxic Substances and Disease Registry

HEAST = Health Effects Summary Tables

IRIS = Integrated Risk Information System

PPRTV = Provisional Peer-Reviewed Toxicity Value

PPRTV X = PPRTV appendix screening toxicity value

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

West Bun Pit Area

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	D	IRIS	09/18/2023
2,6-Dinitrotoluene	1.5E+00	$(mg/kg\text{-}day)^{-1}$	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	B2	PPRTV	04/10/2013
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	D	IRIS	09/18/2023
RDX	8.0E-02	$(mg/kg\text{-}day)^{-1}$	100%	8.0E-02	$(mg/kg\text{-}day)^{-1}$	Suggestive evidence of carcinogenic potential	IRIS	09/18/2023
Arsenic	1.5E+00	$(mg/kg\text{-}day)^{-1}$	95%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	09/18/2023
Barium	NA	NA	NA	NA	NA	D	IRIS	09/18/2023
Cadmium	NA	NA	NA	NA	NA	B1	IRIS	09/18/2023
Naphthalene	1.2E-01	$(mg/kg\text{-}day)^{-1}$	58-89%	1.2E-01	$(mg/kg\text{-}day)^{-1}$	Carcinogenic potential cannot be determined	Cal EPA	09/18/2023
1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	5.7E-03	$(mg/kg\text{-}day)^{-1}$	100%	5.7E-03	$(mg/kg\text{-}day)^{-1}$	C	Cal EPA	09/18/2023
1,1-Dichloroethene	NA	NA	NA	NA	NA	C	IRIS	09/18/2023
Benzene	5.5E-02	$(mg/kg\text{-}day)^{-1}$	100%	5.5E-02	$(mg/kg\text{-}day)^{-1}$	Known/likely human carcinogen	IRIS	09/18/2023
Bromomethane	NA	NA	NA	NA	NA	D	IRIS	09/18/2023
Chloroform	3.1E-02	$(mg/kg\text{-}day)^{-1}$	100%	3.1E-02	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic to humans	Cal EPA	09/18/2023
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	1.1E-02	$(mg/kg\text{-}day)^{-1}$	100%	1.1E-02	$(mg/kg\text{-}day)^{-1}$	D	Cal EPA	09/18/2023
Trichloroethene (3)	4.6E-02	$(mg/kg\text{-}day)^{-1}$	100%	4.6E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (Kidney) (3)	9.3E-03	$(mg/kg\text{-}day)^{-1}$	100%	9.3E-03	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (NHL + Liver)	3.7E-02	$(mg/kg\text{-}day)^{-1}$	100%	3.7E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

West Bun Pit Area

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral slope factor should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) This chemical operates with a mutagenic mode of action (EPA, 2005) and would exhibit a greater effect in early-life versus later-life exposure. With the exception of vinyl chloride, chemical-specific toxicity data are not available for childhood and early-life exposures; thus, EPA (2005) default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<26	1

Definitions:
Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
PPRTV = Provisional Peer-Reviewed Toxicity Value
NA = Not Available

Weight of Evidence definitions (EPA, 1986):

Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.

Group B1 chemicals (probable human carcinogens) are agents for which there is limited evidence of possible carcinogenicity in humans.

Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.

Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.

Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

West Bun Pit Area

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Naphthalene	3.4E-05	$(ug/m^3)^{-1}$	Carcinogenic potential cannot be determined	Cal EPA	09/18/2023
1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NA
1,1-Dichloroethane	1.6E-06	$(ug/m^3)^{-1}$	C	Cal EPA	09/18/2023
1,1-Dichloroethene	NA	NA	C	IRIS	09/18/2023
Benzene	7.8E-06	$(ug/m^3)^{-1}$	Known/likely human carcinogen	IRIS	09/18/2023
Bromomethane	NA	NA	D	IRIS	09/18/2023
Chloroform	2.3E-05	$(ug/m^3)^{-1}$	Likely to be carcinogenic to humans	IRIS	09/18/2023
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA
Ethylbenzene	2.5E-06	$(ug/m^3)^{-1}$	D	Cal EPA	09/18/2023
Trichloroethene (1)	4.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (kidney) (1)	1.0E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (NHL + Liver)	3.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023

Note:

(1) This chemical operates with a mutagenic mode of action (EPA, 2005) and would exhibit a greater effect in early-life versus later-life exposure. With the exception of vinyl chloride, chemical-specific toxicity data are not available for childhood and early-life exposures; 2005); thus, EPA (default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<26	1

Definitions: Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
NA = Not Available

Weight of Evidence definitions (EPA, 1986):

Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.

Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.

Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.

Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (I	2.5E+06	$\mu g/m^3$	NA	NA	NA	NA	NA	2.4E+03	mg/m^3	5.0E+00	mg/m3	4.7E+02
				1,1-Dichloroethene	5.6E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	5.3E-02	mg/m^3	2.0E-01	mg/m3	2.7E-01
				Bromomethane	1.8E+00	$\mu g/m^3$	NA	NA	NA	NA	NA	1.7E-03	mg/m^3	5.0E-03	mg/m3	3.4E-01
				Chloroform	1.9E+00	$\mu g/m^3$	NA	NA	NA	NA	NA	1.9E-03	mg/m^3	9.8E-02	mg/m3	1.9E-02
				cis-1,2-Dichloroethene	5.7E+00	$\mu g/m^3$	NA	NA	NA	NA	NA	5.5E-03	mg/m^3	4.0E-02	mg/m3	1.4E-01
				Dichlorodifluoromethane	2.5E+03	$\mu g/m^3$	NA	NA	NA	NA	NA	2.4E+00	mg/m^3	1.0E-01	mg/m3	2.4E+01
				Trichloroethene	1.3E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	1.2E-02	mg/m^3	2.0E-03	mg/m3	6.0E+00
			Exp. Route Total								NA					5.0E+02
		Exposure Point Total									NA					5.0E+02
	Exposure Medium Total										NA					5.0E+02
Groundwater	Tapwater	Tapwater	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	NA	NA	NA	NA	NA	8.4E-05	mg/kg/day	1.0E-04	mg/kg/day	8.4E-01
				2,6-Dinitrotoluene	1.0E+00	µg/L	NA	NA	NA	NA	NA	3.0E-05	mg/kg/day	3.0E-04	mg/kg/day	1.0E-01
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	NA	NA	NA	NA	NA	1.6E-05	mg/kg/day	1.0E-04	mg/kg/day	1.6E-01
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	NA	NA	NA	NA	NA	3.3E-05	mg/kg/day	1.0E-04	mg/kg/day	3.3E-01
				HMX	4.5E+02	µg/L	NA	NA	NA	NA	NA	1.3E-02	mg/kg/day	5.0E-02	mg/kg/day	2.7E-01
				RDX	9.4E+02	µg/L	NA	NA	NA	NA	NA	2.8E-02	mg/kg/day	4.0E-03	mg/kg/day	7.0E+00
				Arsenic	3.7E+01	µg/L	NA	NA	NA	NA	NA	1.1E-03	mg/kg/day	3.0E-04	mg/kg/day	3.7E+00
				Barium	9.6E+02	µg/L	NA	NA	NA	NA	NA	2.9E-02	mg/kg/day	2.0E-01	mg/kg/day	1.4E-01
				Cadmium	6.3E-01	µg/L	NA	NA	NA	NA	NA	1.9E-05	mg/kg/day	1.0E-04	mg/kg/day	1.9E-01
				Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	9.6E-05	mg/kg/day	2.0E-02	mg/kg/day	4.8E-03
				1,1,2-Trichlorotrifluoroethane (I	1.8E+05	µg/L	NA	NA	NA	NA	NA	5.4E+00	mg/kg/day	3.0E+01	mg/kg/day	1.8E-01
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	1.0E-04	mg/kg/day	2.0E-01	mg/kg/day	5.2E-04
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	2.4E-03	mg/kg/day	5.0E-02	mg/kg/day	4.7E-02
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	1.4E-05	mg/kg/day	4.0E-03	mg/kg/day	3.5E-03
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	2.5E-04	mg/kg/day	1.4E-03	mg/kg/day	1.8E-01
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	6.3E-04	mg/kg/day	1.0E-02	mg/kg/day	6.3E-02
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	2.0E-03	mg/kg/day	8.5E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	6.9E-03	mg/kg/day	2.0E-01	mg/kg/day	3.4E-02
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	5.7E-05	mg/kg/day	1.0E-01	mg/kg/day	5.7E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	1.6E-03	mg/kg/day	5.0E-04	mg/kg/day	3.2E+00
			Exp. Route Total								NA					1.7E+01

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	1,3-Dinitrobenzene	2.8E+00	µg/L	NA	NA	NA	NA	NA	2.6E-06	mg/kg/day	1.0E-04	mg/kg/day	2.6E-02
				2,6-Dinitrotoluene	1.0E+00	µg/L	NA	NA	NA	NA	NA	2.1E-06	mg/kg/day	3.0E-04	mg/kg/day	7.1E-03
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	NA	NA	NA	NA	NA	7.0E-07	mg/kg/day	1.0E-04	mg/kg/day	7.0E-03
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	NA	NA	NA	NA	NA	1.4E-06	mg/kg/day	1.0E-04	mg/kg/day	1.4E-02
				HMX	4.5E+02	µg/L	NA	NA	NA	NA	NA	2.4E-05	mg/kg/day	5.0E-02	mg/kg/day	4.7E-04
				RDX	9.4E+02	µg/L	NA	NA	NA	NA	NA	2.4E-04	mg/kg/day	4.0E-03	mg/kg/day	5.9E-02
				Arsenic	3.7E+01	µg/L	NA	NA	NA	NA	NA	6.2E-06	mg/kg/day	3.0E-04	mg/kg/day	2.1E-02
				Barium	9.6E+02	µg/L	NA	NA	NA	NA	NA	1.6E-04	mg/kg/day	1.4E-02	mg/kg/day	1.1E-02
				Cadmium	6.3E-01	µg/L	NA	NA	NA	NA	NA	1.1E-07	mg/kg/day	5.0E-06	mg/kg/day	2.1E-02
				Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	6.1E-05	mg/kg/day	2.0E-02	mg/kg/day	3.0E-03
				1,1,2-Trichlorotrifluoroethane (	1.8E+05	µg/L	NA	NA	NA	NA	NA	1.9E+00	mg/kg/day	3.0E+01	mg/kg/day	6.3E-02
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	8.0E-06	mg/kg/day	2.0E-01	mg/kg/day	4.0E-05
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	3.1E-04	mg/kg/day	5.0E-02	mg/kg/day	6.1E-03
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	2.1E-06	mg/kg/day	4.0E-03	mg/kg/day	5.3E-04
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	7.8E-06	mg/kg/day	1.4E-03	mg/kg/day	5.6E-03
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	5.5E-05	mg/kg/day	1.0E-02	mg/kg/day	5.5E-03
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.1E-04	mg/kg/day	2.0E-03	mg/kg/day	1.0E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	8.0E-04	mg/kg/day	2.0E-01	mg/kg/day	4.0E-03
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	3.3E-05	mg/kg/day	1.0E-01	mg/kg/day	3.3E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	2.6E-04	mg/kg/day	5.0E-04	mg/kg/day	5.2E-01
			Exp. Route Total								NA					8.8E-01
		Exposure Point Total									NA					1.8E+01
	Exposure Medium Total										NA					1.8E+01

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	1.5E-03	mg/m^3	3.0E-03	mg/m3	5.1E-01
				1,1,2-Trichlorotrifluoroethane (I	1.8E+05	µg/L	NA	NA	NA	NA	NA	8.6E+01	mg/m^3	5.0E+00	mg/m3	1.7E+01
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	3.8E-02	mg/m^3	2.0E-01	mg/m3	1.9E-01
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	2.3E-04	mg/m^3	3.0E-02	mg/m3	7.5E-03
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	4.0E-03	mg/m^3	5.0E-03	mg/m3	8.1E-01
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	1.0E-02	mg/m^3	9.8E-02	mg/m3	1.0E-01
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.7E-02	mg/m^3	4.0E-02	mg/m3	6.8E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	1.1E-01	mg/m^3	1.0E-01	mg/m3	1.1E+00
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	9.1E-04	mg/m^3	1.0E+00	mg/m3	9.1E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	2.6E-02	mg/m^3	2.0E-03	mg/m3	1.3E+01
			Exp. Route Total								NA					3.4E+01
		Exposure Point Total									NA					3.4E+01
	Exposure Medium Total										NA					3.4E+01
Groundwater Total											NA					5.6E+02
Receptor Total											NA					6E+02

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.1.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,3-Dinitrobenzene	2.8E+00	1.7E-03	8.7E-03	9.2E-01	2.2E+00	1.0E+00	0.71	1.1E-08	2
2,6-Dinitrotoluene	1.0E+00	3.7E-03	1.9E-02	1.1E+00	2.6E+00	1.0E+00	0.71	9.0E-09	2
2-Amino-4,6-dinitrotoluene	5.4E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	3.0E-09	2
4-Amino-2,6-dinitrotoluene	1.1E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	6.0E-09	2
HMX	4.5E+02	4.4E-05	2.9E-04	4.8E+00	1.1E+01	1.0E+00	0.71	1.0E-07	2
RDX	9.4E+02	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.71	1.0E-06	2
Arsenic	3.7E+01	1.0E-03	NA	NA	NA	NA	0.71	2.6E-08	1
Barium	9.6E+02	1.0E-03	NA	NA	NA	NA	0.71	6.8E-07	1
Cadmium	6.3E-01	1.0E-03	NA	NA	NA	NA	0.71	4.5E-10	1
Naphthalene	3.2E+00	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.71	2.6E-07	2
1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.71	8.0E-03	2
1,1-Dichloroethane	3.5E+00	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.71	3.4E-08	2
1,1-Dichloroethene	7.9E+01	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.71	1.3E-06	2
Benzene	4.7E-01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.71	9.0E-09	3
Bromomethane	8.4E+00	2.8E-03	1.1E-02	3.6E-01	8.6E-01	1.0E+00	0.71	3.3E-08	2
Chloroform	2.1E+01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.71	2.3E-07	2
cis-1,2-Dichloroethene	5.7E+01	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.71	8.8E-07	2
Dichlorodifluoromethane	2.3E+02	9.0E-03	3.8E-02	5.0E-01	1.2E+00	1.0E+00	0.71	3.4E-06	2
Ethylbenzene	1.9E+00	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.71	1.4E-07	2
Trichloroethene	5.4E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.71	1.1E-06	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + 3B^2)/(1+B)^2)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon	2.5E+06	$\mu g/m^3$	NA	NA	NA	NA	NA	2.4E+03	mg/m^3	5.0E+00	mg/m3	4.7E+02
				1,1-Dichloroethene	5.6E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	5.3E-02	mg/m^3	2.0E-01	mg/m3	2.7E-01
				Bromomethane	1.8E+00	$\mu g/m^3$	NA	NA	NA	NA	NA	1.7E-03	mg/m^3	5.0E-03	mg/m3	3.4E-01
				Chloroform	1.9E+00	$\mu g/m^3$	NA	NA	NA	NA	NA	1.9E-03	mg/m^3	9.8E-02	mg/m3	1.9E-02
				cis-1,2-Dichloroethene	5.7E+00	$\mu g/m^3$	NA	NA	NA	NA	NA	5.5E-03	mg/m^3	4.0E-02	mg/m3	1.4E-01
				Dichlorodifluoromethane	2.5E+03	$\mu g/m^3$	NA	NA	NA	NA	NA	2.4E+00	mg/m^3	1.0E-01	mg/m3	2.4E+01
				Trichloroethene	1.3E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	1.2E-02	mg/m^3	2.0E-03	mg/m3	6.0E+00
			Exp. Route Total								NA					5.0E+02
		Exposure Point Total									NA					5.0E+02
	Exposure Medium Total										NA					5.0E+02
Groundwater	Tapwater	Tapwater	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	NA	NA	NA	NA	NA	1.4E-04	mg/kg/day	1.0E-04	mg/kg/day	1.4E+00
				2,6-Dinitrotoluene	1.0E+00	µg/L	NA	NA	NA	NA	NA	5.0E-05	mg/kg/day	3.0E-04	mg/kg/day	1.7E-01
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	NA	NA	NA	NA	NA	2.7E-05	mg/kg/day	1.0E-04	mg/kg/day	2.7E-01
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	NA	NA	NA	NA	NA	5.5E-05	mg/kg/day	1.0E-04	mg/kg/day	5.5E-01
				HMX	4.5E+02	µg/L	NA	NA	NA	NA	NA	2.2E-02	mg/kg/day	5.0E-02	mg/kg/day	4.5E-01
				RDX	9.4E+02	µg/L	NA	NA	NA	NA	NA	4.7E-02	mg/kg/day	4.0E-03	mg/kg/day	1.2E+01
				Arsenic	3.7E+01	µg/L	NA	NA	NA	NA	NA	1.8E-03	mg/kg/day	3.0E-04	mg/kg/day	6.1E+00
				Barium	9.6E+02	µg/L	NA	NA	NA	NA	NA	4.8E-02	mg/kg/day	2.0E-01	mg/kg/day	2.4E-01
				Cadmium	6.3E-01	µg/L	NA	NA	NA	NA	NA	3.1E-05	mg/kg/day	1.0E-04	mg/kg/day	3.1E-01
				Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	1.6E-04	mg/kg/day	2.0E-02	mg/kg/day	8.0E-03
				1,1,2-Trichlorotrifluoroethane (Freon	1.8E+05	µg/L	NA	NA	NA	NA	NA	9.0E+00	mg/kg/day	3.0E+01	mg/kg/day	3.0E-01
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	1.7E-04	mg/kg/day	2.0E-01	mg/kg/day	8.7E-04
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	3.9E-03	mg/kg/day	5.0E-02	mg/kg/day	7.9E-02
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	2.3E-05	mg/kg/day	4.0E-03	mg/kg/day	5.9E-03
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	4.2E-04	mg/kg/day	1.4E-03	mg/kg/day	3.0E-01
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	1.0E-03	mg/kg/day	1.0E-02	mg/kg/day	1.0E-01
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	2.0E-03	mg/kg/day	1.4E+00
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	1.1E-02	mg/kg/day	2.0E-01	mg/kg/day	5.7E-02
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	9.5E-05	mg/kg/day	1.0E-01	mg/kg/day	9.5E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	2.7E-03	mg/kg/day	5.0E-04	mg/kg/day	5.4E+00
			Exp. Route Total								NA					2.9E+01

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater (cont.)	Tapwater	Tapwater	Dermal	1,3-Dinitrobenzene	2.80E+00	µg/L	NA	NA	NA	NA	NA	3.9E-06	mg/kg/day	1.0E-04	mg/kg/day	3.9E-02
				2,6-Dinitrotoluene	1.00E+00	µg/L	NA	NA	NA	NA	NA	3.2E-06	mg/kg/day	3.0E-04	mg/kg/day	1.1E-02
				2-Amino-4,6-dinitrotoluene	5.40E-01	µg/L	NA	NA	NA	NA	NA	1.1E-06	mg/kg/day	1.0E-04	mg/kg/day	1.1E-02
				4-Amino-2,6-dinitrotoluene	1.10E+00	µg/L	NA	NA	NA	NA	NA	2.1E-06	mg/kg/day	1.0E-04	mg/kg/day	2.1E-02
				HMX	4.50E+02	µg/L	NA	NA	NA	NA	NA	3.5E-05	mg/kg/day	5.0E-02	mg/kg/day	7.1E-04
				RDX	9.40E+02	µg/L	NA	NA	NA	NA	NA	3.5E-04	mg/kg/day	4.0E-03	mg/kg/day	8.9E-02
				Arsenic	3.70E+01	µg/L	NA	NA	NA	NA	NA	8.1E-06	mg/kg/day	3.0E-04	mg/kg/day	2.7E-02
				Barium	9.60E+02	µg/L	NA	NA	NA	NA	NA	2.1E-04	mg/kg/day	1.4E-02	mg/kg/day	1.5E-02
				Cadmium	6.30E-01	µg/L	NA	NA	NA	NA	NA	1.4E-07	mg/kg/day	5.0E-06	mg/kg/day	2.8E-02
				Naphthalene	3.20E+00	µg/L	NA	NA	NA	NA	NA	9.1E-05	mg/kg/day	2.0E-02	mg/kg/day	4.6E-03
				1,1,2-Trichlorotrifluoroethane (Freon	1.80E+05	µg/L	NA	NA	NA	NA	NA	2.8E+00	mg/kg/day	3.0E+01	mg/kg/day	9.4E-02
				1,1-Dichloroethane	3.50E+00	µg/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	2.0E-01	mg/kg/day	6.0E-05
				1,1-Dichloroethene	7.90E+01	µg/L	NA	NA	NA	NA	NA	4.6E-04	mg/kg/day	5.0E-02	mg/kg/day	9.3E-03
				Benzene	4.70E-01	µg/L	NA	NA	NA	NA	NA	3.1E-06	mg/kg/day	4.0E-03	mg/kg/day	7.8E-04
				Bromomethane	8.40E+00	µg/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	1.4E-03	mg/kg/day	8.4E-03
				Chloroform	2.10E+01	µg/L	NA	NA	NA	NA	NA	8.3E-05	mg/kg/day	1.0E-02	mg/kg/day	8.3E-03
				cis-1,2-Dichloroethene	5.70E+01	µg/L	NA	NA	NA	NA	NA	3.1E-04	mg/kg/day	2.0E-03	mg/kg/day	1.6E-01
				Dichlorodifluoromethane	2.30E+02	µg/L	NA	NA	NA	NA	NA	1.2E-03	mg/kg/day	2.0E-01	mg/kg/day	6.0E-03
				Ethylbenzene	1.90E+00	µg/L	NA	NA	NA	NA	NA	5.0E-05	mg/kg/day	1.0E-01	mg/kg/day	5.0E-04
				Trichloroethene	5.40E+01	µg/L	NA	NA	NA	NA	NA	3.9E-04	mg/kg/day	5.0E-04	mg/kg/day	7.8E-01
			Exp. Route Total								NA					1.3E+00
		Exposure Point Total									NA					3.0E+01
	Exposure Medium Total										NA					3.0E+01

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	1.5E-03	mg/m^3	3.0E-03	mg/m3	5.1E-01
				1,1,2-Trichlorotrifluoroethane (Freon	1.8E+05	µg/L	NA	NA	NA	NA	NA	8.6E+01	mg/m^3	5.0E+00	mg/m3	1.7E+01
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	3.8E-02	mg/m^3	2.0E-01	mg/m3	1.9E-01
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	2.3E-04	mg/m^3	3.0E-02	mg/m3	7.5E-03
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	4.0E-03	mg/m^3	5.0E-03	mg/m3	8.1E-01
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	1.0E-02	mg/m^3	9.8E-02	mg/m3	1.0E-01
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.7E-02	mg/m^3	4.0E-02	mg/m3	6.8E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	1.1E-01	mg/m^3	1.0E-01	mg/m3	1.1E+00
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	9.1E-04	mg/m^3	1.0E+00	mg/m3	9.1E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	2.6E-02	mg/m^3	2.0E-03	mg/m3	1.3E+01
			Exp. Route Total								NA					3.4E+01
		Exposure Point Total									NA					3.4E+01
	Exposure Medium Total										NA					3.4E+01
Groundwater Total											NA					5.7E+02
Receptor Total											NA					6E+02

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.2.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,3-Dinitrobenzene	2.8E+00	1.7E-03	8.7E-03	9.2E-01	2.2E+00	1.0E+00	0.54	9.5E-09	2
2,6-Dinitrotoluene	1.0E+00	3.7E-03	1.9E-02	1.1E+00	2.6E+00	1.0E+00	0.54	7.9E-09	2
2-Amino-4,6-dinitrotoluene	5.4E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	2.6E-09	2
4-Amino-2,6-dinitrotoluene	1.1E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	5.3E-09	2
HMX	4.5E+02	4.4E-05	2.9E-04	4.8E+00	1.1E+01	1.0E+00	0.54	8.7E-08	2
RDX	9.4E+02	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.54	8.7E-07	2
Arsenic	3.7E+01	1.0E-03	NA	NA	NA	NA	0.54	2.0E-08	1
Barium	9.6E+02	1.0E-03	NA	NA	NA	NA	0.54	5.2E-07	1
Cadmium	6.3E-01	1.0E-03	NA	NA	NA	NA	0.54	3.4E-10	1
Naphthalene	3.2E+00	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.54	2.2E-07	2
1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.54	6.9E-03	2
1,1-Dichloroethane	3.5E+00	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.54	2.9E-08	2
1,1-Dichloroethene	7.9E+01	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.54	1.1E-06	2
Benzene	4.7E-01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.54	7.6E-09	2
Bromomethane	8.4E+00	2.8E-03	1.1E-02	3.6E-01	8.6E-01	1.0E+00	0.54	2.9E-08	2
Chloroform	2.1E+01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.54	2.0E-07	2
cis-1,2-Dichloroethene	5.7E+01	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.54	7.7E-07	2
Dichlorodifluoromethane	2.3E+02	9.0E-03	3.8E-02	5.0E-01	1.2E+00	1.0E+00	0.54	3.0E-06	2
Ethylbenzene	1.9E+00	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.54	1.2E-07	2
Trichloroethene	5.4E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.54	9.6E-07	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (Fr	2.5E+06	µg/m^3	8.8E+02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,1-Dichloroethene	5.6E+01	µg/m^3	2.0E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Bromomethane	1.8E+00	µg/m^3	6.3E-04	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	1.9E+00	µg/m^3	6.9E-04	mg/m^3	2.3E-05	1/(ug/m3)	1.6E-05	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	5.7E+00	µg/m^3	2.0E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Dichlorodifluoromethane	2.5E+03	µg/m^3	8.9E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	1.3E+01	µg/m^3	4.5E-03	mg/m^3	4.1E-06	1/(ug/m3)	2.6E-05	NA	NA	NA	NA	NA
			Exp. Route Total								4.2E-05					NA
		Exposure Point Total									4.2E-05					NA
	Exposure Medium Total										4.2E-05					NA
Groundwater	Tapwater	Tapwater	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	3.6E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				2,6-Dinitrotoluene	1.0E+00	µg/L	1.3E-05	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.9E-05	NA	NA	NA	NA	NA
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	6.9E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	1.4E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				HMX	4.5E+02	µg/L	5.8E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	9.4E+02	µg/L	1.2E-02	mg/kg/day	8.0E-02	1/(mg/kg/day)	9.7E-04	NA	NA	NA	NA	NA
				Arsenic	3.7E+01	µg/L	4.7E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	7.1E-04	NA	NA	NA	NA	NA
				Barium	9.6E+02	µg/L	1.2E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Cadmium	6.3E-01	µg/L	8.1E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Naphthalene	3.2E+00	µg/L	4.1E-05	mg/kg/day	1.2E-01	1/(mg/kg/day)	4.9E-06	NA	NA	NA	NA	NA
				1,1,2-Trichlorotrifluoroethane (Fr	1.8E+05	µg/L	2.3E+00	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1-Dichloroethane	3.5E+00	µg/L	4.5E-05	mg/kg/day	5.7E-03	1/(mg/kg/day)	2.6E-07	NA	NA	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	1.0E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	4.7E-01	µg/L	6.0E-06	mg/kg/day	5.5E-02	1/(mg/kg/day)	3.3E-07	NA	NA	NA	NA	NA
				Bromomethane	8.4E+00	µg/L	1.1E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	2.1E+01	µg/L	2.7E-04	mg/kg/day	3.1E-02	1/(mg/kg/day)	8.4E-06	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	5.7E+01	µg/L	7.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Dichlorodifluoromethane	2.3E+02	µg/L	3.0E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	1.9E+00	µg/L	2.4E-05	mg/kg/day	1.1E-02	1/(mg/kg/day)	2.7E-07	NA	NA	NA	NA	NA
				Trichloroethene	5.4E+01	µg/L	6.9E-04	mg/kg/day	4.6E-02	1/(mg/kg/day)	4.5E-05	NA	NA	NA	NA	NA
			Exp. Route Total								1.8E-03					NA

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Dermal	1,3-Dinitrobenzene	2.8E+00	µg/L	1.1E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
(cont.)				2,6-Dinitrotoluene	1.0E+00	µg/L	8.8E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.3E-06	NA	NA	NA	NA	NA
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	2.9E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	5.9E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				HMX	4.5E+02	µg/L	9.8E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	9.4E+02	µg/L	9.8E-05	mg/kg/day	8.0E-02	1/(mg/kg/day)	7.8E-06	NA	NA	NA	NA	NA
				Arsenic	3.7E+01	µg/L	2.5E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	3.7E-06	NA	NA	NA	NA	NA
				Barium	9.6E+02	µg/L	6.4E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Cadmium	6.3E-01	µg/L	4.2E-08	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Naphthalene	3.2E+00	µg/L	2.5E-05	mg/kg/day	1.2E-01	1/(mg/kg/day)	3.0E-06	NA	NA	NA	NA	NA
				1,1,2-Trichlorotrifluoroethane (Fr	1.8E+05	µg/L	7.8E-01	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1-Dichloroethane	3.5E+00	µg/L	3.3E-06	mg/kg/day	5.7E-03	1/(mg/kg/day)	1.9E-08	NA	NA	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	1.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	4.7E-01	µg/L	8.7E-07	mg/kg/day	5.5E-02	1/(mg/kg/day)	4.8E-08	NA	NA	NA	NA	NA
				Bromomethane	8.4E+00	µg/L	3.2E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	2.1E+01	µg/L	2.3E-05	mg/kg/day	3.1E-02	1/(mg/kg/day)	7.1E-07	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	5.7E+01	µg/L	8.6E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Dichlorodifluoromethane	2.3E+02	µg/L	3.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	1.9E+00	µg/L	1.4E-05	mg/kg/day	1.1E-02	1/(mg/kg/day)	1.5E-07	NA	NA	NA	NA	NA
				Trichloroethene	5.4E+01	µg/L	1.1E-04	mg/kg/day	4.6E-02	1/(mg/kg/day)	5.4E-06	NA	NA	NA	NA	NA
			Exp. Route Total								2.2E-05					NA
		Exposure Point Total									1.8E-03					NA
	Exposure Medium Total										1.8E-03					NA

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Household Air	Vapors in House	Inhalation	Naphthalene	3.2E+00	µg/L	5.7E-04	mg/m^3	3.4E-05	1/(µg/m3)	1.9E-05	NA	NA	NA	NA	NA
(cont.)	(Domestic Use)	(Domestic Use)		1,1,2-Trichlorotrifluoroethane (Fr	1.8E+05	µg/L	3.2E+01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,1-Dichloroethane	3.5E+00	µg/L	6.2E-04	mg/m^3	1.6E-06	1/(µg/m3)	1.0E-06	NA	NA	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	1.4E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	4.7E-01	µg/L	8.4E-05	mg/m^3	7.8E-06	1/(µg/m3)	6.5E-07	NA	NA	NA	NA	NA
				Bromomethane	8.4E+00	µg/L	1.5E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	2.1E+01	µg/L	3.7E-03	mg/m^3	2.3E-05	1/(µg/m3)	8.6E-05	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	5.7E+01	µg/L	1.0E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Dichlorodifluoromethane	2.3E+02	µg/L	4.1E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	1.9E+00	µg/L	3.4E-04	mg/m^3	2.5E-06	1/(µg/m3)	8.5E-07	NA	NA	NA	NA	NA
				Trichloroethene	5.4E+01	µg/L	9.6E-03	mg/m^3	4.1E-06	1/(µg/m3)	5.6E-05	NA	NA	NA	NA	NA
			Exp. Route Total								1.6E-04					NA
		Exposure Point Total									1.6E-04					NA
	Exposure Medium Total										1.6E-04					NA
Groundwater Total											2.0E-03					NA
Receptor Total											2E-03					NA

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
$\mu g/m^3$= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.3.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations														
							Intake							CSF/Unit Risk							Cancer Risk
					Value	Units	Value						Units	Value						Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs	0-6 yrs	6-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)	0-6 yrs (1)	6-26 yrs (2)		
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	1.3E-02	mg/m^3	3.5E-04	6.9E-04	1.7E-03	1.7E-03	NA	NA	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	NA	NA	1/(µg/m^3)	1E-05
	Groundwater	Tapwater	Ingestion	Trichloroethene	5.4E+01	ug/L	7.7E-05	1.5E-04	2.3E-04	2.3E-04	NA	NA	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	NA	NA	1/(mg/kg-day)	2E-05
			Dermal	Trichloroethene	5.4E+01	ug/L	1.1E-05	2.2E-05	3.7E-05	3.7E-05	NA	NA	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	NA	NA	1/(mg/kg-day)	3E-06
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	5.4E+01	ug/L	7.4E-04	1.5E-03	3.7E-03	3.7E-03	NA	NA	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	NA	NA	1/(µg/m^3)	3E-05

Notes:
(1) Continuous lifetime exposure to vinyl chloride from birth.
(2) Continuous lifetime exposure to vinyl chloride during adulthood.
ADAF = Age-dependent adjustment factor
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.3.RME SUPPLEMENT B

CALCULATION OF CHEMICAL CANCER RISKS FOR TRICHLOROETHENE

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	(1)
Groundwater	Indoor Air	Indoor Air	Inhalation	Trichloroethene (Kidney)	1.3E-02	mg/m^3	(2)	mg/m^3	1.0E-06	1/(µg/m3)	1E-05
				Trichloroethene (NHL + Liver)	1.3E-02	mg/m^3	4.5E-03	mg/m^3	3.1E-06	1/(µg/m3)	1E-05
			Exp. Route Total								3E-05
	Tapwater	Tapwater	Ingestion	Trichloroethene (Kidney)	5.4E+01	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	2E-05
				Trichloroethene (NHL + Liver)	5.4E+01	µg/L	6.9E-04	mg/kg/day	3.7E-02	1/(mg/kg/day)	3E-05
			Exp. Route Total								5E-05
			Dermal	Trichloroethene (Kidney)	5.4E+01	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	3E-06
				Trichloroethene (NHL + Liver)	5.4E+01	µg/L	6.4E-05	mg/kg/day	3.7E-02	1/(mg/kg/day)	2E-06
			Exp. Route Total								5E-06
	Household Air	Household Air	Inhalation	Trichloroethene (Kidney)	5.4E+01	µg/L	(2)	mg/m^3	1.0E-06	1/(µg/m3)	3E-05
				Trichloroethene (NHL + Liver)	5.4E+01	µg/L	9.6E-03	mg/m^3	3.1E-06	1/(µg/m3)	3E-05
			Exp. Route Total								6E-05

Notes:

(1) Carcinogenic risks were estimated for trichloroethene by summing the risks for two different approaches: 1) Using the oral CSF factor for kidney cancer, which has a mutagenic mode of action (calculated in Table 7.3 RME Supplement A), and 2) using the CSF for non-Hodgkin lymphoma (NHL) and liver cancer.

(2) Intakes and exposure concentrations using the toxicity values for the kidney component of TCE were estimated on Table 7.3 RME Supplement A.

CSF = Cancer slope factor

µg/L = microgram per liter

mg/m^3= milligram per cubic meter

mg/kg/day = milligram per kilogram per day

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,1-Trichloroethane	8.4E+02	μg/m^3	6.8E-02	mg/m^3	NA	NA	NA
				1,1,2-Trichloroethane	4.5E-02	μg/m^3	3.6E-06	mg/m^3	1.6E-05	1/(ug/m3)	5.8E-08
				1,1-Dichloroethane	6.9E+02	μg/m^3	5.7E-02	mg/m^3	1.6E-06	1/(ug/m3)	9.1E-05
				1,1-Dichloroethene	1.9E+02	μg/m^3	1.5E-02	mg/m^3	NA	NA	NA
				1,2,4-Trimethylbenzene	1.3E+01	μg/m^3	1.0E-03	mg/m^3	NA	NA	NA
				1,2-Dichloroethane	2.2E+00	μg/m^3	1.8E-04	mg/m^3	2.6E-05	1/(ug/m3)	4.7E-06
				Benzene	1.2E+01	μg/m^3	9.5E-04	mg/m^3	7.8E-06	1/(ug/m3)	7.4E-06
				cis-1,2-Dichloroethene	2.0E+02	μg/m^3	1.6E-02	mg/m^3	NA	NA	NA
				Ethylbenzene	2.1E+01	μg/m^3	1.7E-03	mg/m^3	2.5E-06	1/(ug/m3)	4.3E-06
				Tetrachloroethene	2.3E+01	μg/m^3	1.9E-03	mg/m^3	2.6E-07	1/(ug/m3)	4.8E-07
				Trichloroethene	1.9E+01	μg/m^3	1.6E-03	mg/m^3	4.1E-06	1/(ug/m3)	6.4E-06
				Vinyl chloride	4.3E+02	μg/m^3	3.5E-02	mg/m^3	8.8E-06	1/(ug/m3)	3.1E-04
				Xylene, m,p-	8.5E+01	μg/m^3	6.9E-03	mg/m^3	NA	NA	NA
				Xylene, o-	2.2E+01	μg/m^3	NA	NA	NA	NA	NA
			Exp. Route Total								4.2E-04
		Exposure Point Total									4.2E-04
	Exposure Medium Total										4.2E-04

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	3.7E-06	mg/kg/day	NA	NA	NA
(cont.)				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	1.3E-05	mg/kg/day	NA	NA	NA
				RDX	5.1E+00	µg/L	1.6E-05	mg/kg/day	8.0E-02	1/(mg/kg/day)	1.2E-06
				Arsenic	5.6E+01	µg/L	1.7E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.6E-04
				Barium	2.0E+03	µg/L	6.1E-03	mg/kg/day	NA	NA	NA
				1,1,1-Trichloroethane	1.6E+03	µg/L	4.9E-03	mg/kg/day	NA	NA	NA
				1,1,2-Trichloroethane	1.2E+00	µg/L	3.6E-06	mg/kg/day	5.7E-02	1/(mg/kg/day)	2.0E-07
				1,1-Dichloroethane	4.9E+03	µg/L	1.5E-02	mg/kg/day	5.7E-03	1/(mg/kg/day)	8.5E-05
				1,1-Dichloroethene	1.0E+02	µg/L	3.1E-04	mg/kg/day	NA	NA	NA
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	1.0E-04	mg/kg/day	NA	NA	NA
				1,2-Dichloroethane	2.3E+01	µg/L	7.0E-05	mg/kg/day	9.1E-02	1/(mg/kg/day)	6.3E-06
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	3.0E-05	mg/kg/day	NA	NA	NA
				Acetone	6.7E+03	µg/L	2.0E-02	mg/kg/day	NA	NA	NA
				Benzene	3.5E+01	µg/L	1.1E-04	mg/kg/day	5.5E-02	1/(mg/kg/day)	5.9E-06
				Chloroethane	3.2E+02	µg/L	9.8E-04	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	1.1E-06	mg/kg/day	3.1E-02	1/(mg/kg/day)	3.3E-08
				cis-1,2-Dichloroethene	1.8E+03	µg/L	5.6E-03	mg/kg/day	NA	NA	NA
				Ethylbenzene	3.9E+01	µg/L	1.2E-04	mg/kg/day	1.1E-02	1/(mg/kg/day)	1.3E-06
				Methyl ethyl ketone	5.1E+03	µg/L	1.6E-02	mg/kg/day	NA	NA	NA

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	
				Methyl isobutyl ketone	1.7E+03	µg/L	5.2E-03	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	4.9E-04	mg/kg/day	2.0E-03	1/(mg/kg/day)	9.8E-07
				Naphthalene	1.0E+01	µg/L	3.1E-05	mg/kg/day	1.2E-01	1/(mg/kg/day)	3.7E-06
				Tetrachloroethene	5.7E+01	µg/L	1.7E-04	mg/kg/day	2.1E-03	1/(mg/kg/day)	3.6E-07
				Toluene	1.0E+03	µg/L	3.1E-03	mg/kg/day	NA	NA	NA
				Trichloroethene	2.7E+01	µg/L	8.3E-05	mg/kg/day	4.6E-02	1/(mg/kg/day)	3.8E-06
				Vinyl chloride	5.1E+02	µg/L	1.6E-03	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.3E-03
				Xylene, m,p-	1.6E+02	µg/L	4.9E-04	mg/kg/day	NA	NA	NA
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA
			Exp. Route Total								2.7E-03

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Dermal	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	2.7E-08	mg/kg/day	NA	NA	NA
(cont.)				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	9.8E-08	mg/kg/day	NA	NA	NA
				RDX	5.1E+00	µg/L	2.2E-08	mg/kg/day	8.0E-02	1/(mg/kg/day)	1.8E-09
				Arsenic	5.6E+01	µg/L	8.6E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.3E-07
				Barium	2.0E+03	µg/L	3.1E-06	mg/kg/day	NA	NA	NA
				1,1,1-Trichloroethane	1.6E+03	µg/L	1.5E-04	mg/kg/day	NA	NA	NA
				1,1,2-Trichloroethane	1.2E+00	µg/L	4.2E-08	mg/kg/day	5.7E-02	1/(mg/kg/day)	2.4E-09
				1,1-Dichloroethane	4.9E+03	µg/L	1.9E-04	mg/kg/day	5.7E-03	1/(mg/kg/day)	1.1E-06
				1,1-Dichloroethene	1.0E+02	µg/L	6.7E-06	mg/kg/day	NA	NA	NA
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	1.9E-05	mg/kg/day	NA	NA	NA
				1,2-Dichloroethane	2.3E+01	µg/L	5.5E-07	mg/kg/day	9.1E-02	1/(mg/kg/day)	5.0E-08
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	4.1E-06	mg/kg/day	NA	NA	NA
				Acetone	6.7E+03	µg/L	1.5E-05	mg/kg/day	NA	NA	NA
				Benzene	3.5E+01	µg/L	2.7E-06	mg/kg/day	5.5E-02	1/(mg/kg/day)	1.5E-07
				Chloroethane	3.2E+02	µg/L	9.1E-06	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	1.6E-08	mg/kg/day	3.1E-02	1/(mg/kg/day)	4.9E-10
				cis-1,2-Dichloroethene	1.8E+03	µg/L	1.2E-04	mg/kg/day	NA	NA	NA
				Ethylbenzene	3.9E+01	µg/L	1.2E-05	mg/kg/day	1.1E-02	1/(mg/kg/day)	1.3E-07
				Methyl ethyl ketone	5.1E+03	µg/L	2.4E-05	mg/kg/day	NA	NA	NA

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk
				Methyl isobutyl ketone	1.7E+03	µg/L	3.2E-05	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	3.0E-06	mg/kg/day	2.0E-03	1/(mg/kg/day)	6.0E-09
				Naphthalene	1.0E+01	µg/L	3.3E-06	mg/kg/day	1.2E-01	1/(mg/kg/day)	3.9E-07
				Tetrachloroethene	5.7E+01	µg/L	1.7E-05	mg/kg/day	2.1E-03	1/(mg/kg/day)	3.5E-08
				Toluene	1.0E+03	µg/L	1.8E-04	mg/kg/day	NA	NA	NA
				Trichloroethene	2.7E+01	µg/L	2.2E-06	mg/kg/day	4.6E-02	1/(mg/kg/day)	1.0E-07
				Vinyl chloride	5.1E+02	µg/L	2.0E-05	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.9E-05
				Xylene, m,p-	1.6E+02	µg/L	4.9E-05	mg/kg/day	NA	NA	NA
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA
			Exp. Route Total								3.1E-05
		Exposure Point Total									2.7E-03
	Exposure Medium Total										2.7E-03
Groundwater Total											3.2E-03
Receptor Total											3E-03

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	

RfC = Reference concentration

RfD = Reference dose

µg/L = microgram per liter

µg/m^3= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

Non-Cancer Hazard Calculations				
Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
Value	Units	Value	Units	
1.9E-01	mg/m^3	5.0E+00	mg/m3	3.8E-02
1.0E-05	mg/m^3	2.0E-04	mg/m3	5.1E-02
1.6E-01	mg/m^3	NA	NA	NA
4.3E-02	mg/m^3	2.0E-01	mg/m3	2.2E-01
2.9E-03	mg/m^3	6.0E-02	mg/m3	4.8E-02
5.1E-04	mg/m^3	7.0E-03	mg/m3	7.3E-02
2.7E-03	mg/m^3	3.0E-02	mg/m3	8.9E-02
4.6E-02	mg/m^3	4.0E-02	mg/m3	1.1E+00
4.9E-03	mg/m^3	1.0E+00	mg/m3	4.9E-03
5.2E-03	mg/m^3	4.0E-02	mg/m3	1.3E-01
4.4E-03	mg/m^3	2.0E-03	mg/m3	2.2E+00
9.9E-02	mg/m^3	1.0E-01	mg/m3	9.9E-01
1.9E-02	mg/m^3	1.0E-01	mg/m3	1.9E-01
2.1E-02	mg/m^3	1.0E-01	mg/m3	2.1E-01
				5.4E+00
				5.4E+00
				5.4E+00

Non-Cancer Hazard Calculations				
Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
Value	Units	Value	Units	
1.0E-05	mg/kg/day	1.0E-04	mg/kg/day	1.0E-01
3.8E-05	mg/kg/day	1.0E-04	mg/kg/day	3.8E-01
4.4E-05	mg/kg/day	4.0E-03	mg/kg/day	1.1E-02
4.8E-04	mg/kg/day	3.0E-04	mg/kg/day	1.6E+00
1.7E-02	mg/kg/day	2.0E-01	mg/kg/day	8.6E-02
1.4E-02	mg/kg/day	2.0E+00	mg/kg/day	6.8E-03
9.9E-06	mg/kg/day	4.0E-03	mg/kg/day	2.5E-03
4.2E-02	mg/kg/day	2.0E-01	mg/kg/day	2.1E-01
8.6E-04	mg/kg/day	5.0E-02	mg/kg/day	1.7E-02
2.9E-04	mg/kg/day	1.0E-02	mg/kg/day	2.9E-02
1.9E-04	mg/kg/day	6.0E-03	mg/kg/day	3.2E-02
8.5E-05	mg/kg/day	1.0E-02	mg/kg/day	8.5E-03
5.7E-02	mg/kg/day	9.0E-01	mg/kg/day	6.4E-02
3.0E-04	mg/kg/day	4.0E-03	mg/kg/day	7.5E-02
2.8E-03	mg/kg/day	NA	NA	NA
3.0E-06	mg/kg/day	1.0E-02	mg/kg/day	3.0E-04
1.6E-02	mg/kg/day	2.0E-03	mg/kg/day	7.8E+00
3.3E-04	mg/kg/day	1.0E-01	mg/kg/day	3.3E-03
4.4E-02	mg/kg/day	6.0E-01	mg/kg/day	7.3E-02

Non-Cancer Hazard Calculations				
Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
Value	Units	Value	Units	
1.5E-02	mg/kg/day	NA	NA	NA
1.4E-03	mg/kg/day	6.0E-03	mg/kg/day	2.3E-01
8.6E-05	mg/kg/day	2.0E-02	mg/kg/day	4.3E-03
4.9E-04	mg/kg/day	6.0E-03	mg/kg/day	8.1E-02
8.8E-03	mg/kg/day	8.0E-02	mg/kg/day	1.1E-01
2.3E-04	mg/kg/day	5.0E-04	mg/kg/day	4.6E-01
4.4E-03	mg/kg/day	3.0E-03	mg/kg/day	1.5E+00
1.4E-03	mg/kg/day	2.0E-01	mg/kg/day	6.8E-03
1.7E-03	mg/kg/day	2.0E-01	mg/kg/day	8.6E-03
				1.3E+01

Non-Cancer Hazard Calculations				
Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
Value	Units	Value	Units	
7.5E-08	mg/kg/day	1.0E-04	mg/kg/day	7.5E-04
2.7E-07	mg/kg/day	1.0E-04	mg/kg/day	2.7E-03
6.2E-08	mg/kg/day	4.0E-03	mg/kg/day	1.5E-05
2.4E-07	mg/kg/day	3.0E-04	mg/kg/day	8.0E-04
8.6E-06	mg/kg/day	1.4E-02	mg/kg/day	6.1E-04
4.1E-04	mg/kg/day	2.0E+00	mg/kg/day	2.0E-04
1.2E-07	mg/kg/day	4.0E-03	mg/kg/day	3.0E-05
5.4E-04	mg/kg/day	2.0E-01	mg/kg/day	2.7E-03
1.9E-05	mg/kg/day	5.0E-02	mg/kg/day	3.7E-04
5.3E-05	mg/kg/day	1.0E-02	mg/kg/day	5.3E-03
1.6E-06	mg/kg/day	6.0E-03	mg/kg/day	2.6E-04
1.2E-05	mg/kg/day	1.0E-02	mg/kg/day	1.2E-03
4.3E-05	mg/kg/day	9.0E-01	mg/kg/day	4.8E-05
7.4E-06	mg/kg/day	4.0E-03	mg/kg/day	1.9E-03
2.5E-05	mg/kg/day	NA	NA	NA
4.4E-08	mg/kg/day	1.0E-02	mg/kg/day	4.4E-06
3.2E-04	mg/kg/day	2.0E-03	mg/kg/day	1.6E-01
3.2E-05	mg/kg/day	1.0E-01	mg/kg/day	3.2E-04
6.7E-05	mg/kg/day	6.0E-01	mg/kg/day	1.1E-04

Non-Cancer Hazard Calculations				
Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
Value	Units	Value	Units	
8.9E-05	mg/kg/day	NA	NA	NA
8.4E-06	mg/kg/day	6.0E-03	mg/kg/day	1.4E-03
9.1E-06	mg/kg/day	2.0E-02	mg/kg/day	4.6E-04
4.7E-05	mg/kg/day	6.0E-03	mg/kg/day	7.9E-03
5.0E-04	mg/kg/day	8.0E-02	mg/kg/day	6.2E-03
6.3E-06	mg/kg/day	5.0E-04	mg/kg/day	1.3E-02
5.5E-05	mg/kg/day	3.0E-03	mg/kg/day	1.8E-02
1.4E-04	mg/kg/day	2.0E-01	mg/kg/day	6.8E-04
5.4E-04	mg/kg/day	2.0E-01	mg/kg/day	2.7E-03
				2.3E-01
				1.3E+01
				1.3E+01
				1.8E+01
				2E+01

Non-Cancer Hazard Calculations				
Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
Value	Units	Value	Units	

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113	2.5E+06	µg/m^3	2.0E+02	mg/m^3	NA	NA	NA	5.6E+02	mg/m^3	5.0E+00	mg/m3	1.1E+02
				1,1-Dichloroethene	5.6E+01	µg/m^3	4.5E-03	mg/m^3	NA	NA	NA	1.3E-02	mg/m^3	2.0E-01	mg/m3	6.3E-02
				Bromomethane	1.8E+00	µg/m^3	1.4E-04	mg/m^3	NA	NA	NA	4.0E-04	mg/m^3	5.0E-03	mg/m3	8.0E-02
				Chloroform	1.9E+00	µg/m^3	1.6E-04	mg/m^3	2.3E-05	1/(ug/m3)	3.6E-06	4.4E-04	mg/m^3	9.8E-02	mg/m3	4.5E-03
				Dichlorodifluoromethane	2.5E+03	µg/m^3	2.0E-01	mg/m^3	NA	NA	NA	5.7E-01	mg/m^3	1.0E-01	mg/m3	5.7E+00
				Trichloroethene	1.3E+01	µg/m^3	1.0E-03	mg/m^3	4.1E-06	1/(ug/m3)	4.2E-06	2.9E-03	mg/m^3	2.0E-03	mg/m3	1.4E+00
			Exp. Route Total								7.8E-06					1.2E+02
		Exposure Point Total									7.8E-06					1.2E+02
	Exposure Medium Total										7.8E-06					1.2E+02
	Tapwater	Tapwater	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	8.6E-06	mg/kg/day	NA	NA	NA	2.4E-05	mg/kg/day	1.0E-04	mg/kg/day	2.4E-01
				2,6-Dinitrotoluene	1.0E+00	µg/L	3.1E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	4.6E-06	8.6E-06	mg/kg/day	3.0E-04	mg/kg/day	2.9E-02
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	1.7E-06	mg/kg/day	NA	NA	NA	4.6E-06	mg/kg/day	1.0E-04	mg/kg/day	4.6E-02
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	3.4E-06	mg/kg/day	NA	NA	NA	9.4E-06	mg/kg/day	1.0E-04	mg/kg/day	9.4E-02
				HMX	4.5E+02	µg/L	1.4E-03	mg/kg/day	NA	NA	NA	3.9E-03	mg/kg/day	5.0E-02	mg/kg/day	7.7E-02
				RDX	9.4E+02	µg/L	2.9E-03	mg/kg/day	8.0E-02	1/(mg/kg/day)	2.3E-04	8.0E-03	mg/kg/day	4.0E-03	mg/kg/day	2.0E+00
				Arsenic	3.7E+01	µg/L	1.1E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.7E-04	3.2E-04	mg/kg/day	3.0E-04	mg/kg/day	1.1E+00
				Barium	9.6E+02	µg/L	2.9E-03	mg/kg/day	NA	NA	NA	8.2E-03	mg/kg/day	2.0E-01	mg/kg/day	4.1E-02
				Naphthalene	3.2E+00	µg/L	9.8E-06	mg/kg/day	1.2E-01	1/(mg/kg/day)	1.2E-06	2.7E-05	mg/kg/day	2.0E-02	mg/kg/day	1.4E-03
				1,1,2-Trichlorotrifluoroethane (Freon 113	1.8E+05	µg/L	5.5E-01	mg/kg/day	NA	NA	NA	1.5E+00	mg/kg/day	3.0E+01	mg/kg/day	5.1E-02
				1,1-Dichloroethane	3.5E+00	µg/L	1.1E-05	mg/kg/day	5.7E-03	1/(mg/kg/day)	6.1E-08	3.0E-05	mg/kg/day	2.0E-01	mg/kg/day	1.5E-04
				1,1-Dichloroethene	7.9E+01	µg/L	2.4E-04	mg/kg/day	NA	NA	NA	6.8E-04	mg/kg/day	5.0E-02	mg/kg/day	1.4E-02
				Benzene	4.7E-01	µg/L	1.4E-06	mg/kg/day	5.5E-02	1/(mg/kg/day)	7.9E-08	4.0E-06	mg/kg/day	4.0E-03	mg/kg/day	1.0E-03
				Bromomethane	8.4E+00	µg/L	2.6E-05	mg/kg/day	NA	NA	NA	7.2E-05	mg/kg/day	1.4E-03	mg/kg/day	5.1E-02
				Chloroform	2.1E+01	µg/L	6.4E-05	mg/kg/day	3.1E-02	1/(mg/kg/day)	2.0E-06	1.8E-04	mg/kg/day	1.0E-02	mg/kg/day	1.8E-02
				cis-1,2-Dichloroethene	5.7E+01	µg/L	1.7E-04	mg/kg/day	NA	NA	NA	4.9E-04	mg/kg/day	2.0E-03	mg/kg/day	2.4E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	7.0E-04	mg/kg/day	NA	NA	NA	2.0E-03	mg/kg/day	2.0E-01	mg/kg/day	9.8E-03
				Ethylbenzene	1.9E+00	µg/L	5.8E-06	mg/kg/day	1.1E-02	1/(mg/kg/day)	6.4E-08	1.6E-05	mg/kg/day	1.0E-01	mg/kg/day	1.6E-04
				Trichloroethene	5.4E+01	µg/L	1.7E-04	mg/kg/day	4.6E-02	1/(mg/kg/day)	7.6E-06	4.6E-04	mg/kg/day	5.0E-04	mg/kg/day	9.2E-01
			Exp. Route Total								4.2E-04					4.9E+00

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	1,3-Dinitrobenzene	2.8E+00	µg/L	4.4E-08	mg/kg/day	NA	NA	NA	1.2E-07	mg/kg/day	1.0E-04	mg/kg/day	1.2E-03
				2,6-Dinitrotoluene	1.0E+00	µg/L	3.7E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	5.5E-08	1.0E-07	mg/kg/day	3.0E-04	mg/kg/day	3.4E-04
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	1.2E-08	mg/kg/day	NA	NA	NA	3.4E-08	mg/kg/day	1.0E-04	mg/kg/day	3.4E-04
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	2.5E-08	mg/kg/day	NA	NA	NA	6.9E-08	mg/kg/day	1.0E-04	mg/kg/day	6.9E-04
				HMX	4.5E+02	µg/L	4.1E-07	mg/kg/day	NA	NA	NA	1.1E-06	mg/kg/day	5.0E-02	mg/kg/day	2.3E-05
				RDX	9.4E+02	µg/L	4.1E-06	mg/kg/day	8.0E-02	1/(mg/kg/day)	3.2E-07	1.1E-05	mg/kg/day	4.0E-03	mg/kg/day	2.8E-03
				Arsenic	3.7E+01	µg/L	5.7E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	8.5E-08	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.3E-04
				Barium	9.6E+02	µg/L	1.5E-06	mg/kg/day	NA	NA	NA	4.1E-06	mg/kg/day	1.4E-02	mg/kg/day	2.9E-04
				Naphthalene	3.2E+00	µg/L	1.0E-06	mg/kg/day	1.2E-01	1/(mg/kg/day)	1.3E-07	2.9E-06	mg/kg/day	2.0E-02	mg/kg/day	1.5E-04
				1,1,2-Trichlorotrifluoroethane (Freon 113	1.8E+05	µg/L	3.2E-02	mg/kg/day	NA	NA	NA	9.0E-02	mg/kg/day	3.0E+01	mg/kg/day	3.0E-03
				1,1-Dichloroethane	3.5E+00	µg/L	1.4E-07	mg/kg/day	5.7E-03	1/(mg/kg/day)	7.8E-10	3.8E-07	mg/kg/day	2.0E-01	mg/kg/day	1.9E-06
				1,1-Dichloroethene	7.9E+01	µg/L	5.3E-06	mg/kg/day	NA	NA	NA	1.5E-05	mg/kg/day	5.0E-02	mg/kg/day	3.0E-04
				Benzene	4.7E-01	µg/L	3.6E-08	mg/kg/day	5.5E-02	1/(mg/kg/day)	2.0E-09	9.9E-08	mg/kg/day	4.0E-03	mg/kg/day	2.5E-05
				Bromomethane	8.4E+00	µg/L	1.3E-07	mg/kg/day	NA	NA	NA	3.8E-07	mg/kg/day	1.4E-03	mg/kg/day	2.7E-04
				Chloroform	2.1E+01	µg/L	9.5E-07	mg/kg/day	3.1E-02	1/(mg/kg/day)	2.9E-08	2.7E-06	mg/kg/day	1.0E-02	mg/kg/day	2.7E-04
				cis-1,2-Dichloroethene	5.7E+01	µg/L	3.6E-06	mg/kg/day	NA	NA	NA	1.0E-05	mg/kg/day	2.0E-03	mg/kg/day	5.0E-03
				Dichlorodifluoromethane	2.3E+02	µg/L	1.4E-05	mg/kg/day	NA	NA	NA	3.9E-05	mg/kg/day	2.0E-01	mg/kg/day	1.9E-04
				Ethylbenzene	1.9E+00	µg/L	5.7E-07	mg/kg/day	1.1E-02	1/(mg/kg/day)	6.3E-09	1.6E-06	mg/kg/day	1.0E-01	mg/kg/day	1.6E-05
				Trichloroethene	5.4E+01	µg/L	4.5E-06	mg/kg/day	4.6E-02	1/(mg/kg/day)	2.1E-07	1.3E-05	mg/kg/day	5.0E-04	mg/kg/day	2.5E-02
			Exp. Route Total								8.3E-07					4.1E-02
		Exposure Point Total									4.2E-04					5.0E+00
	Exposure Medium Total										4.2E-04					5.0E+00
Groundwater Total											4.2E-04					1.3E+02
Receptor Total											4E-04					1E+02

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.5.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,3-Dinitrobenzene	2.8E+00	1.7E-03	8.7E-03	9.2E-01	2.2E+00	1.0E+00	0.20	5.8E-09	2
2,6-Dinitrotoluene	1.0E+00	3.7E-03	1.9E-02	1.1E+00	2.6E+00	1.0E+00	0.20	4.8E-09	2
2-Amino-4,6-dinitrotoluene	5.4E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.20	1.6E-09	2
4-Amino-2,6-dinitrotoluene	1.1E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.20	3.2E-09	2
HMX	4.5E+02	4.4E-05	2.9E-04	4.8E+00	1.1E+01	1.0E+00	0.20	5.3E-08	2
RDX	9.4E+02	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.20	5.3E-07	2
Arsenic	3.7E+01	1.0E-03	NA	NA	NA	NA	0.20	7.4E-09	1
Barium	9.6E+02	1.0E-03	NA	NA	NA	NA	0.20	1.9E-07	1
Naphthalene	3.2E+00	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.20	1.4E-07	2
1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.20	4.2E-03	2
1,1-Dichloroethane	3.5E+00	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.20	1.8E-08	2
1,1-Dichloroethene	7.9E+01	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.20	6.9E-07	2
Benzene	4.7E-01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.20	4.6E-09	2
Bromomethane	8.4E+00	2.8E-03	1.1E-02	3.6E-01	8.6E-01	1.0E+00	0.20	1.8E-08	2
Chloroform	2.1E+01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.20	1.2E-07	2
cis-1,2-Dichloroethene	5.7E+01	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.20	4.7E-07	2
Dichlorodifluoromethane	2.3E+02	9.0E-03	3.8E-02	5.0E-01	1.2E+00	1.0E+00	0.20	1.8E-06	2
Ethylbenzene	1.9E+00	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.20	7.4E-08	2
Trichloroethene	5.4E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.20	5.9E-07	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.6.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,3-Dinitrobenzene	2.8E+00	1.7E-03	8.7E-03	9.2E-01	2.2E+00	1.0E+00	1.0	1.3E-08	1
2,6-Dinitrotoluene	1.0E+00	3.7E-03	1.9E-02	1.1E+00	2.6E+00	1.0E+00	1.0	1.1E-08	1
2-Amino-4,6-dinitrotoluene	5.1E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	1.0	3.3E-09	1
4-Amino-2,6-dinitrotoluene	1.1E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	1.0	7.2E-09	1
HMX	4.5E+02	4.4E-05	2.9E-04	4.8E+00	1.1E+01	1.0E+00	1.0	1.2E-07	1
RDX	9.4E+02	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	1.0	1.2E-06	1
Barium	6.4E+02	1.0E-03	NA	NA	NA	NA	1.0	6.4E-07	1
Naphthalene	2.7E-01	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	1.0	2.6E-08	1
1,1,2-Trichlorotrifluoroethane (Freon 113)	2.8E+04	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	1.0	1.5E-03	1
1,1-Dichloroethane	3.5E+00	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	1.0	4.1E-08	2
1,1-Dichloroethene	2.9E+01	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	1.0	5.9E-07	2
Bromomethane	8.4E+00	2.8E-03	1.1E-02	3.6E-01	8.6E-01	1.0E+00	1.0	4.1E-08	2
Chloroform	2.2E+00	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	1.0	2.9E-08	2
cis-1,2-Dichloroethene	5.7E+01	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	1.0	1.1E-06	3
Dichlorodifluoromethane	2.3E+02	9.0E-03	3.8E-02	5.0E-01	1.2E+00	1.0E+00	1.0	4.0E-06	2
Trichloroethene	5.4E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	1.0	1.3E-06	2

Organics: DAevent (mg/cm^2-event) =

DA_{event} =

$t_{event} \le t^*$: DA_{event} (mg/cm^2-event) =
$2 \times FA \times Kp \times Cw \times (\mathrm{sqrt}((6 \times \tau \times t_{event}) / (3.1415))) \times CF1 \times CF2$ (Eq 1)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
$FA \times Kp \times CW \times (t_{event}/(1+B) + 2 \times \tau \times ((1 + 3B + 3B^2)/(1+B)^2)) \times CF1 \times CF2$ (Eq 2)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004,*Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	1.3E-10	mg/kg-day	NA	NA	NA	2.7E-07	mg/kg/day	5.0E-04	mg/kg/day	5.4E-04
				2,6-Dinitrotoluene	1.0E+00	µg/L	4.5E-11	mg/kg-day	1.5E+00	1/(mg/kg/day)	6.8E-11	9.6E-08	mg/kg/day	4.0E-03	mg/kg/day	2.4E-05
				2-Amino-4,6-dinitrotoluene	5.1E-01	µg/L	2.3E-11	mg/kg-day	NA	NA	NA	4.9E-08	mg/kg/day	3.0E-04	mg/kg/day	1.6E-04
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	5.0E-11	mg/kg-day	NA	NA	NA	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	3.5E-04
				HMX	4.5E+02	µg/L	2.0E-08	mg/kg-day	NA	NA	NA	4.3E-05	mg/kg/day	5.0E-02	mg/kg/day	8.7E-04
				RDX	9.4E+02	µg/L	4.2E-08	mg/kg-day	8.0E-02	1/(mg/kg/day)	3.4E-09	9.0E-05	mg/kg/day	1.0E-01	mg/kg/day	9.0E-04
				Barium	6.4E+02	µg/L	2.9E-08	mg/kg-day	NA	NA	NA	6.2E-05	mg/kg/day	2.0E-01	mg/kg/day	3.1E-04
				Naphthalene	2.7E-01	µg/L	1.2E-11	mg/kg-day	1.2E-01	1/(mg/kg/day)	1.5E-12	2.6E-08	mg/kg/day	6.0E-01	mg/kg/day	4.3E-08
				1,1,2-Trichlorotrifluoroethane	2.8E+04	µg/L	1.3E-06	mg/kg-day	NA	NA	NA	2.7E-03	mg/kg/day	3.0E+01	mg/kg/day	9.0E-05
				1,1-Dichloroethane	3.5E+00	µg/L	1.6E-10	mg/kg-day	5.7E-03	1/(mg/kg/day)	9.0E-13	3.4E-07	mg/kg/day	2.0E+00	mg/kg/day	1.7E-07
				1,1-Dichloroethene	2.9E+01	µg/L	1.3E-09	mg/kg-day	NA	NA	NA	2.8E-06	mg/kg/day	9.0E-03	mg/kg/day	3.1E-04
				Bromomethane	8.4E+00	µg/L	3.8E-10	mg/kg-day	NA	NA	NA	8.1E-07	mg/kg/day	5.0E-03	mg/kg/day	1.6E-04
				Chloroform	2.2E+00	µg/L	9.9E-11	mg/kg-day	3.1E-02	1/(mg/kg/day)	3.1E-12	2.1E-07	mg/kg/day	1.0E-01	mg/kg/day	2.1E-06
				cis-1,2-Dichloroethene	5.7E+01	µg/L	2.6E-09	mg/kg-day	NA	NA	NA	5.5E-06	mg/kg/day	2.0E-02	mg/kg/day	2.7E-04
				Dichlorodifluoromethane	2.3E+02	µg/L	1.0E-08	mg/kg-day	NA	NA	NA	2.2E-05	mg/kg/day	5.0E-02	mg/kg/day	4.4E-04
				Trichloroethene	5.4E+01	µg/L	2.4E-09	mg/kg-day	4.6E-02	1/(mg/kg/day)	1.1E-10	5.2E-06	mg/kg/day	5.0E-04	mg/kg/day	1.0E-02
			Exp. Route Total								3.6E-09					1.5E-02
			Dermal	1,3-Dinitrobenzene	2.8E+00	µg/L	3.9E-10	mg/kg-day	NA	NA	NA	8.4E-07	mg/kg-day	5.0E-04	mg/kg/day	1.7E-03
				2,6-Dinitrotoluene	1.0E+00	µg/L	3.3E-10	mg/kg-day	1.5E+00	1/(mg/kg/day)	4.9E-10	7.0E-07	mg/kg-day	4.0E-03	mg/kg/day	1.7E-04
				2-Amino-4,6-dinitrotoluene	5.1E-01	µg/L	1.0E-10	mg/kg-day	NA	NA	NA	2.2E-07	mg/kg-day	3.0E-04	mg/kg/day	7.2E-04
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	2.2E-10	mg/kg-day	NA	NA	NA	4.7E-07	mg/kg-day	3.0E-04	mg/kg/day	1.6E-03
				HMX	4.5E+02	µg/L	3.6E-09	mg/kg-day	NA	NA	NA	7.7E-06	mg/kg-day	5.0E-02	mg/kg/day	1.5E-04
				RDX	9.4E+02	µg/L	3.6E-08	mg/kg-day	8.0E-02	1/(mg/kg/day)	2.9E-09	7.7E-05	mg/kg-day	1.0E-01	mg/kg/day	7.7E-04
				Barium	6.4E+02	µg/L	2.0E-08	mg/kg-day	NA	NA	NA	4.2E-05	mg/kg-day	1.4E-02	mg/kg/day	3.0E-03
				Naphthalene	2.7E-01	µg/L	7.9E-10	mg/kg-day	1.2E-01	1/(mg/kg/day)	9.4E-11	1.7E-06	mg/kg-day	6.0E-01	mg/kg/day	2.8E-06
				1,1,2-Trichlorotrifluoroethane	2.8E+04	µg/L	4.5E-05	mg/kg-day	NA	NA	NA	9.6E-02	mg/kg-day	3.0E+01	mg/kg/day	3.2E-03
				1,1-Dichloroethane	3.5E+00	µg/L	1.3E-09	mg/kg-day	5.7E-03	1/(mg/kg/day)	7.2E-12	2.7E-06	mg/kg-day	2.0E+00	mg/kg/day	1.3E-06
				1,1-Dichloroethene	2.9E+01	µg/L	1.8E-08	mg/kg-day	NA	NA	NA	3.8E-05	mg/kg-day	9.0E-03	mg/kg/day	4.2E-03
				Bromomethane	8.4E+00	µg/L	1.2E-09	mg/kg-day	NA	NA	NA	2.7E-06	mg/kg-day	5.0E-03	mg/kg/day	5.3E-04
				Chloroform	2.2E+00	µg/L	8.9E-10	mg/kg-day	3.1E-02	1/(mg/kg/day)	2.8E-11	1.9E-06	mg/kg-day	1.0E-01	mg/kg/day	1.9E-05
				cis-1,2-Dichloroethene	5.7E+01	µg/L	3.3E-08	mg/kg-day	NA	NA	NA	7.0E-05	mg/kg-day	2.0E-02	mg/kg/day	3.5E-03
				Dichlorodifluoromethane	2.3E+02	µg/L	1.2E-07	mg/kg-day	NA	NA	NA	2.6E-04	mg/kg-day	5.0E-02	mg/kg/day	5.2E-03
				Trichloroethene	5.4E+01	µg/L	4.0E-08	mg/kg-day	4.6E-02	1/(mg/kg/day)	1.8E-09	8.5E-05	mg/kg-day	5.0E-04	mg/kg/day	1.7E-01
			Exp. Route Total								5.4E-09					2.0E-01
		Exposure Point Total									8.9E-09					2.1E-01
	Exposure Medium Total										8.9E-09					2.1E-01

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Shallow Groundwater	Trench Air	Vapors in a Trench	Inhalation	Naphthalene	1.7E+00	$\mu g/m^3$	2.3E-08	mg/m^3	3.4E-05	1/(ug/m3)	8.0E-10	5.0E-05	mg/m^3	3.0E-03	mg/m3	1.7E-02
				1,1,2-Trichlorotrifluoroethane	1.7E+05	$\mu g/m^3$	2.3E-03	mg/m^3	NA	NA	NA	4.8E+00	mg/m^3	5.0E+01	mg/m3	9.7E-02
				1,1-Dichloroethane	2.9E+01	$\mu g/m^3$	3.9E-07	mg/m^3	1.6E-06	1/(ug/m3)	6.2E-10	8.2E-04	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	2.4E+02	$\mu g/m^3$	3.3E-06	mg/m^3	NA	NA	NA	6.9E-03	mg/m^3	2.0E-01	mg/m3	3.5E-02
				Bromomethane	7.0E+01	$\mu g/m^3$	9.5E-07	mg/m^3	NA	NA	NA	2.0E-03	mg/m^3	1.0E-01	mg/m3	2.0E-02
				Chloroform	1.6E+01	$\mu g/m^3$	2.2E-07	mg/m^3	2.3E-05	1/(ug/m3)	5.1E-09	4.7E-04	mg/m^3	2.4E-01	mg/m3	1.9E-03
				cis-1,2-Dichloroethene	4.7E+02	$\mu g/m^3$	6.3E-06	mg/m^3	NA	NA	NA	1.3E-02	mg/m^3	NA	NA	NA
				Dichlorodifluoromethane	7.9E+02	$\mu g/m^3$	1.1E-05	mg/m^3	NA	NA	NA	2.3E-02	mg/m^3	1.0E+00	mg/m3	2.3E-02
				Trichloroethene	3.9E+02	$\mu g/m^3$	5.2E-06	mg/m^3	4.1E-06	1/(ug/m3)	2.1E-08	1.1E-02	mg/m^3	2.0E-03	mg/m3	5.5E+00
			Exp. Route Total								2.8E-08					5.7E+00
		Exposure Point Total									2.8E-08					5.7E+00
	Exposure Medium Total										2.8E-08					5.7E+00
Groundwater Total											3.7E-08					5.9E+00
Receptor Total											4E-08					6E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
$\mu g/m^3$= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.5E+06	µg/m^3	2.0E+02	mg/m^3	NA	NA	NA	5.6E+02	mg/m^3	5.0E+00	mg/m3	1.1E+02
				1,1-Dichloroethene	5.6E+01	µg/m^3	4.5E-03	mg/m^3	NA	NA	NA	1.3E-02	mg/m^3	2.0E-01	mg/m3	6.3E-02
				Bromomethane	1.8E+00	µg/m^3	1.4E-04	mg/m^3	NA	NA	NA	4.0E-04	mg/m^3	5.0E-03	mg/m3	8.0E-02
				Chloroform	1.9E+00	µg/m^3	1.6E-04	mg/m^3	2.3E-05	1/(ug/m3)	3.6E-06	4.4E-04	mg/m^3	9.8E-02	mg/m3	4.5E-03
				cis-1,2-Dichloroethene	5.7E+00	µg/m^3	4.7E-04	mg/m^3	NA	NA	NA	1.3E-03	mg/m^3	4.0E-02	mg/m3	3.3E-02
				Dichlorodifluoromethane	2.5E+03	µg/m^3	2.0E-01	mg/m^3	NA	NA	NA	5.7E-01	mg/m^3	1.0E-01	mg/m3	5.7E+00
				Trichloroethene	1.3E+01	µg/m^3	1.0E-03	mg/m^3	4.1E-06	1/(ug/m3)	4.2E-06	2.9E-03	mg/m^3	2.0E-03	mg/m3	1.4E+00
			Exp. Route Total								7.8E-06					1.2E+02
		Exposure Point Total									7.8E-06					1.2E+02
	Exposure Medium Total										7.8E-06					1.2E+02
Groundwater Total											7.8E-06					1.2E+02
Receptor Total											8E-06					1E+02

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.5E+06	$\mu g/m^3$	2.0E+02	mg/m^3	NA	NA	NA	5.6E+02	mg/m^3	5.0E+00	mg/m3	1.1E+02
				1,1-Dichloroethene	5.6E+01	$\mu g/m^3$	4.5E-03	mg/m^3	NA	NA	NA	1.3E-02	mg/m^3	2.0E-01	mg/m3	6.3E-02
				Bromomethane	1.8E+00	$\mu g/m^3$	1.4E-04	mg/m^3	NA	NA	NA	4.0E-04	mg/m^3	5.0E-03	mg/m3	8.0E-02
				Chloroform	1.9E+00	$\mu g/m^3$	1.6E-04	mg/m^3	2.3E-05	1/(ug/m3)	3.6E-06	4.4E-04	mg/m^3	9.8E-02	mg/m3	4.5E-03
				cis-1,2-Dichloroethene	5.7E+00	$\mu g/m^3$	4.7E-04	mg/m^3	NA	NA	NA	1.3E-03	mg/m^3	4.0E-02	mg/m3	3.3E-02
				Dichlorodifluoromethane	2.5E+03	$\mu g/m^3$	2.0E-01	mg/m^3	NA	NA	NA	5.7E-01	mg/m^3	1.0E-01	mg/m3	5.7E+00
				Trichloroethene	1.3E+01	$\mu g/m^3$	1.0E-03	mg/m^3	4.1E-06	1/(ug/m3)	4.2E-06	2.9E-03	mg/m^3	2.0E-03	mg/m3	1.4E+00
			Exp. Route Total								7.8E-06					1.2E+02
		Exposure Point Total									7.8E-06					1.2E+02
	Exposure Medium Total										7.8E-06					1.2E+02
	Tapwater	Tapwater	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	8.6E-06	mg/kg/day	NA	NA	NA	2.4E-05	mg/kg/day	1.0E-04	mg/kg/day	2.4E-01
				2,6-Dinitrotoluene	1.0E+00	µg/L	3.1E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	4.6E-06	8.6E-06	mg/kg/day	3.0E-04	mg/kg/day	2.9E-02
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	1.7E-06	mg/kg/day	NA	NA	NA	4.6E-06	mg/kg/day	1.0E-04	mg/kg/day	4.6E-02
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	3.4E-06	mg/kg/day	NA	NA	NA	9.4E-06	mg/kg/day	1.0E-04	mg/kg/day	9.4E-02
				HMX	4.5E+02	µg/L	1.4E-03	mg/kg/day	NA	NA	NA	3.9E-03	mg/kg/day	5.0E-02	mg/kg/day	7.7E-02
				RDX	9.4E+02	µg/L	2.9E-03	mg/kg/day	8.0E-02	1/(mg/kg/day)	2.3E-04	8.0E-03	mg/kg/day	4.0E-03	mg/kg/day	2.0E+00
				Arsenic	3.7E+01	µg/L	1.1E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.7E-04	3.2E-04	mg/kg/day	3.0E-04	mg/kg/day	1.1E+00
				Barium	9.6E+02	µg/L	2.9E-03	mg/kg/day	NA	NA	NA	8.2E-03	mg/kg/day	2.0E-01	mg/kg/day	4.1E-02
				Naphthalene	3.2E+00	µg/L	9.8E-06	mg/kg/day	1.2E-01	1/(mg/kg/day)	1.2E-06	2.7E-05	mg/kg/day	2.0E-02	mg/kg/day	1.4E-03
				1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	µg/L	5.5E-01	mg/kg/day	NA	NA	NA	1.5E+00	mg/kg/day	3.0E+01	mg/kg/day	5.1E-02
				1,1-Dichloroethane	3.5E+00	µg/L	1.1E-05	mg/kg/day	5.7E-03	1/(mg/kg/day)	6.1E-08	3.0E-05	mg/kg/day	2.0E-01	mg/kg/day	1.5E-04
				1,1-Dichloroethene	7.9E+01	µg/L	2.4E-04	mg/kg/day	NA	NA	NA	6.8E-04	mg/kg/day	5.0E-02	mg/kg/day	1.4E-02
				Benzene	4.7E-01	µg/L	1.4E-06	mg/kg/day	5.5E-02	1/(mg/kg/day)	7.9E-08	4.0E-06	mg/kg/day	4.0E-03	mg/kg/day	1.0E-03
				Bromomethane	8.4E+00	µg/L	2.6E-05	mg/kg/day	NA	NA	NA	7.2E-05	mg/kg/day	1.4E-03	mg/kg/day	5.1E-02
				Chloroform	2.1E+01	µg/L	6.4E-05	mg/kg/day	3.1E-02	1/(mg/kg/day)	2.0E-06	1.8E-04	mg/kg/day	1.0E-02	mg/kg/day	1.8E-02
				cis-1,2-Dichloroethene	5.7E+01	µg/L	1.7E-04	mg/kg/day	NA	NA	NA	4.9E-04	mg/kg/day	2.0E-03	mg/kg/day	2.4E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	7.0E-04	mg/kg/day	NA	NA	NA	2.0E-03	mg/kg/day	2.0E-01	mg/kg/day	9.8E-03
				Ethylbenzene	1.9E+00	µg/L	5.8E-06	mg/kg/day	1.1E-02	1/(mg/kg/day)	6.4E-08	1.6E-05	mg/kg/day	1.0E-01	mg/kg/day	1.6E-04
				Trichloroethene	5.4E+01	µg/L	1.7E-04	mg/kg/day	4.6E-02	1/(mg/kg/day)	7.6E-06	4.6E-04	mg/kg/day	5.0E-04	mg/kg/day	9.2E-01
			Exp. Route Total								4.2E-04					4.9E+00

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future	
Receptor Population: Site Worker	
Receptor Age: Adult	

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	1,3-Dinitrobenzene	2.8E+00	µg/L	4.4E-08	mg/kg/day	NA	NA	NA	1.2E-07	mg/kg/day	1.0E-04	mg/kg/day	1.2E-03
				2,6-Dinitrotoluene	1.0E+00	µg/L	3.7E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	5.5E-08	1.0E-07	mg/kg/day	3.0E-04	mg/kg/day	3.4E-04
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	1.2E-08	mg/kg/day	NA	NA	NA	3.4E-08	mg/kg/day	1.0E-04	mg/kg/day	3.4E-04
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	2.5E-08	mg/kg/day	NA	NA	NA	6.9E-08	mg/kg/day	1.0E-04	mg/kg/day	6.9E-04
				HMX	4.5E+02	µg/L	4.1E-07	mg/kg/day	NA	NA	NA	1.1E-06	mg/kg/day	5.0E-02	mg/kg/day	2.3E-05
				RDX	9.4E+02	µg/L	4.1E-06	mg/kg/day	8.0E-02	1/(mg/kg/day)	3.2E-07	1.1E-05	mg/kg/day	4.0E-03	mg/kg/day	2.8E-03
				Arsenic	3.7E+01	µg/L	5.7E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	8.5E-08	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.3E-04
				Barium	9.6E+02	µg/L	1.5E-06	mg/kg/day	NA	NA	NA	4.1E-06	mg/kg/day	1.4E-02	mg/kg/day	2.9E-04
				Naphthalene	3.2E+00	µg/L	1.0E-06	mg/kg/day	1.2E-01	1/(mg/kg/day)	1.3E-07	2.9E-06	mg/kg/day	2.0E-02	mg/kg/day	1.5E-04
				1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	µg/L	3.2E-02	mg/kg/day	NA	NA	NA	9.0E-02	mg/kg/day	3.0E+01	mg/kg/day	3.0E-03
				1,1-Dichloroethane	3.5E+00	µg/L	1.4E-07	mg/kg/day	5.7E-03	1/(mg/kg/day)	7.8E-10	3.8E-07	mg/kg/day	2.0E-01	mg/kg/day	1.9E-06
				1,1-Dichloroethene	7.9E+01	µg/L	5.3E-06	mg/kg/day	NA	NA	NA	1.5E-05	mg/kg/day	5.0E-02	mg/kg/day	3.0E-04
				Benzene	4.7E-01	µg/L	3.6E-08	mg/kg/day	5.5E-02	1/(mg/kg/day)	2.0E-09	9.9E-08	mg/kg/day	4.0E-03	mg/kg/day	2.5E-05
				Bromomethane	8.4E+00	µg/L	1.3E-07	mg/kg/day	NA	NA	NA	3.8E-07	mg/kg/day	1.4E-03	mg/kg/day	2.7E-04
				Chloroform	2.1E+01	µg/L	9.5E-07	mg/kg/day	3.1E-02	1/(mg/kg/day)	2.9E-08	2.7E-06	mg/kg/day	1.0E-02	mg/kg/day	2.7E-04
				cis-1,2-Dichloroethene	5.7E+01	µg/L	3.6E-06	mg/kg/day	NA	NA	NA	1.0E-05	mg/kg/day	2.0E-03	mg/kg/day	5.0E-03
				Dichlorodifluoromethane	2.3E+02	µg/L	1.4E-05	mg/kg/day	NA	NA	NA	3.9E-05	mg/kg/day	2.0E-01	mg/kg/day	1.9E-04
				Ethylbenzene	1.9E+00	µg/L	5.7E-07	mg/kg/day	1.1E-02	1/(mg/kg/day)	6.3E-09	1.6E-06	mg/kg/day	1.0E-01	mg/kg/day	1.6E-05
				Trichloroethene	5.4E+01	µg/L	4.5E-06	mg/kg/day	4.6E-02	1/(mg/kg/day)	2.1E-07	1.3E-05	mg/kg/day	5.0E-04	mg/kg/day	2.5E-02
			Exp. Route Total								8.3E-07					4.1E-02
		Exposure Point Total									4.2E-04					5.0E+00
	Exposure Medium Total										4.2E-04					5.0E+00
Groundwater Total											4.2E-04					1.3E+02
Receptor Total											4E-04					1E+02

Notes:

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

µg/L = microgram per liter

µg/m^3= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 7.8.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,3-Dinitrobenzene	2.8E+00	1.7E-03	8.7E-03	9.2E-01	2.2E+00	1.0E+00	0.20	5.8E-09	2
2,6-Dinitrotoluene	1.0E+00	3.7E-03	1.9E-02	1.1E+00	2.6E+00	1.0E+00	0.20	4.8E-09	2
2-Amino-4,6-dinitrotoluene	5.4E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.20	1.6E-09	2
4-Amino-2,6-dinitrotoluene	1.1E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.20	3.2E-09	2
HMX	4.5E+02	4.4E-05	2.9E-04	4.8E+00	1.1E+01	1.0E+00	0.20	5.3E-08	2
RDX	9.4E+02	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.20	5.3E-07	2
Arsenic	3.7E+01	1.0E-03	NA	NA	NA	NA	0.20	7.4E-09	1
Barium	9.6E+02	1.0E-03	NA	NA	NA	NA	0.20	1.9E-07	1
Naphthalene	3.2E+00	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.20	1.4E-07	2
1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.20	4.2E-03	2
1,1-Dichloroethane	3.5E+00	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.20	1.8E-08	2
1,1-Dichloroethene	7.9E+01	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.20	6.9E-07	2
Benzene	4.7E-01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.20	4.6E-09	2
Bromomethane	8.4E+00	2.8E-03	1.1E-02	3.6E-01	8.6E-01	1.0E+00	0.20	1.8E-08	2
Chloroform	2.1E+01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.20	1.2E-07	2
cis-1,2-Dichloroethene	5.7E+01	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.20	4.7E-07	2
Dichlorodifluoromethane	2.3E+02	9.0E-03	3.8E-02	5.0E-01	1.2E+00	1.0E+00	0.20	1.8E-06	2
Ethylbenzene	1.9E+00	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.20	7.4E-08	2
Trichloroethene	5.4E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.20	5.9E-07	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	1.3E-10	mg/kg-day	NA	NA	NA	2.7E-07	mg/kg/day	5.0E-04	mg/kg/day	5.4E-04
				2,6-Dinitrotoluene	1.0E+00	µg/L	4.5E-11	mg/kg-day	1.5E+00	1/(mg/kg/day)	6.8E-11	9.6E-08	mg/kg/day	4.0E-03	mg/kg/day	2.4E-05
				2-Amino-4,6-dinitrotoluene	5.1E-01	µg/L	2.3E-11	mg/kg-day	NA	NA	NA	4.9E-08	mg/kg/day	3.0E-04	mg/kg/day	1.6E-04
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	5.0E-11	mg/kg-day	NA	NA	NA	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	3.5E-04
				HMX	4.5E+02	µg/L	2.0E-08	mg/kg-day	NA	NA	NA	4.3E-05	mg/kg/day	5.0E-02	mg/kg/day	8.7E-04
				RDX	9.4E+02	µg/L	4.2E-08	mg/kg-day	8.0E-02	1/(mg/kg/day)	3.4E-09	9.0E-05	mg/kg/day	1.0E-01	mg/kg/day	9.0E-04
				Barium	6.4E+02	µg/L	2.9E-08	mg/kg-day	NA	NA	NA	6.2E-05	mg/kg/day	2.0E-01	mg/kg/day	3.1E-04
				Naphthalene	2.7E-01	µg/L	1.2E-11	mg/kg-day	1.2E-01	1/(mg/kg/day)	1.5E-12	2.6E-08	mg/kg/day	6.0E-01	mg/kg/day	4.3E-08
				1,1,2-Trichlorotrifluoroethane (F	2.8E+04	µg/L	1.3E-06	mg/kg-day	NA	NA	NA	2.7E-03	mg/kg/day	3.0E+01	mg/kg/day	9.0E-05
				1,1-Dichloroethane	3.5E+00	µg/L	1.6E-10	mg/kg-day	5.7E-03	1/(mg/kg/day)	9.0E-13	3.4E-07	mg/kg/day	2.0E+00	mg/kg/day	1.7E-07
				1,1-Dichloroethene	2.9E+01	µg/L	1.3E-09	mg/kg-day	NA	NA	NA	2.8E-06	mg/kg/day	9.0E-03	mg/kg/day	3.1E-04
				Bromomethane	8.4E+00	µg/L	3.8E-10	mg/kg-day	NA	NA	NA	8.1E-07	mg/kg/day	5.0E-03	mg/kg/day	1.6E-04
				Chloroform	2.2E+00	µg/L	9.9E-11	mg/kg-day	3.1E-02	1/(mg/kg/day)	3.1E-12	2.1E-07	mg/kg/day	1.0E-01	mg/kg/day	2.1E-06
				cis-1,2-Dichloroethene	5.7E+01	µg/L	2.6E-09	mg/kg-day	NA	NA	NA	5.5E-06	mg/kg/day	2.0E-02	mg/kg/day	2.7E-04
				Dichlorodifluoromethane	2.3E+02	µg/L	1.0E-08	mg/kg-day	NA	NA	NA	2.2E-05	mg/kg/day	5.0E-02	mg/kg/day	4.4E-04
				Trichloroethene	5.4E+01	µg/L	2.4E-09	mg/kg-day	4.6E-02	1/(mg/kg/day)	1.1E-10	5.2E-06	mg/kg/day	5.0E-04	mg/kg/day	1.0E-02
			Exp. Route Total								3.6E-09					1.5E-02
			Dermal	1,3-Dinitrobenzene	2.8E+00	µg/L	3.9E-10	mg/kg-day	NA	NA	NA	8.4E-07	mg/kg/day	5.0E-04	mg/kg/day	1.7E-03
				2,6-Dinitrotoluene	1.0E+00	µg/L	3.3E-10	mg/kg-day	1.5E+00	1/(mg/kg/day)	4.9E-10	7.0E-07	mg/kg/day	4.0E-03	mg/kg/day	1.7E-04
				2-Amino-4,6-dinitrotoluene	5.1E-01	µg/L	1.0E-10	mg/kg-day	NA	NA	NA	2.2E-07	mg/kg/day	3.0E-04	mg/kg/day	7.2E-04
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	2.2E-10	mg/kg-day	NA	NA	NA	4.7E-07	mg/kg/day	3.0E-04	mg/kg/day	1.6E-03
				HMX	4.5E+02	µg/L	3.6E-09	mg/kg-day	NA	NA	NA	7.7E-06	mg/kg/day	5.0E-02	mg/kg/day	1.5E-04
				RDX	9.4E+02	µg/L	3.6E-08	mg/kg-day	8.0E-02	1/(mg/kg/day)	2.9E-09	7.7E-05	mg/kg/day	1.0E-01	mg/kg/day	7.7E-04
				Barium	6.4E+02	µg/L	2.0E-08	mg/kg-day	NA	NA	NA	4.2E-05	mg/kg/day	1.4E-02	mg/kg/day	3.0E-03
				Naphthalene	2.7E-01	µg/L	7.9E-10	mg/kg-day	1.2E-01	1/(mg/kg/day)	9.4E-11	1.7E-06	mg/kg/day	6.0E-01	mg/kg/day	2.8E-06
				1,1,2-Trichlorotrifluoroethane (F	2.8E+04	µg/L	4.5E-05	mg/kg-day	NA	NA	NA	9.6E-02	mg/kg/day	3.0E+01	mg/kg/day	3.2E-03
				1,1-Dichloroethane	3.5E+00	µg/L	1.3E-09	mg/kg-day	5.7E-03	1/(mg/kg/day)	7.2E-12	2.7E-06	mg/kg/day	2.0E+00	mg/kg/day	1.3E-06
				1,1-Dichloroethene	2.9E+01	µg/L	1.8E-08	mg/kg-day	NA	NA	NA	3.8E-05	mg/kg/day	9.0E-03	mg/kg/day	4.2E-03
				Bromomethane	8.4E+00	µg/L	1.2E-09	mg/kg-day	NA	NA	NA	2.7E-06	mg/kg/day	5.0E-03	mg/kg/day	5.3E-04
				Chloroform	2.2E+00	µg/L	8.9E-10	mg/kg-day	3.1E-02	1/(mg/kg/day)	2.8E-11	1.9E-06	mg/kg/day	1.0E-01	mg/kg/day	1.9E-05
				cis-1,2-Dichloroethene	5.7E+01	µg/L	3.3E-08	mg/kg-day	NA	NA	NA	7.0E-05	mg/kg/day	2.0E-02	mg/kg/day	3.5E-03
				Dichlorodifluoromethane	2.3E+02	µg/L	1.2E-07	mg/kg-day	NA	NA	NA	2.6E-04	mg/kg/day	5.0E-02	mg/kg/day	5.2E-03
				Trichloroethene	5.4E+01	µg/L	4.0E-08	mg/kg-day	4.6E-02	1/(mg/kg/day)	1.8E-09	8.5E-05	mg/kg/day	5.0E-04	mg/kg/day	1.7E-01

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Exp. Route Total								5.4E-09					2.0E-01
		Exposure Point Total									8.9E-09					2.1E-01
	Exposure Medium Total										8.9E-09					2.1E-01
Shallow Groundwater	Trench Air	Vapors in a Trench	Inhalation	Naphthalene	1.7E+00	µg/m^3	2.3E-08	mg/m^3	3.4E-05	1/(ug/m3)	8.0E-10	5.0E-05	mg/m^3	3.0E-03	mg/m3	1.7E-02
				1,1,2-Trichlorotrifluoroethane (F	1.7E+05	µg/m^3	2.3E-03	mg/m^3	NA	NA	NA	4.8E+00	mg/m^3	5.0E+01	mg/m3	9.7E-02
				1,1-Dichloroethane	2.9E+01	µg/m^3	3.9E-07	mg/m^3	1.6E-06	1/(ug/m3)	6.2E-10	8.2E-04	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	2.4E+02	µg/m^3	3.3E-06	mg/m^3	NA	NA	NA	6.9E-03	mg/m^3	2.0E-01	mg/m3	3.5E-02
				Bromomethane	7.0E+01	µg/m^3	9.5E-07	mg/m^3	NA	NA	NA	2.0E-03	mg/m^3	1.0E-01	mg/m3	2.0E-02
				Chloroform	1.6E+01	µg/m^3	2.2E-07	mg/m^3	2.3E-05	1/(ug/m3)	5.1E-09	4.7E-04	mg/m^3	2.4E-01	mg/m3	1.9E-03
				cis-1,2-Dichloroethene	4.7E+02	µg/m^3	6.3E-06	mg/m^3	NA	NA	NA	1.3E-02	mg/m^3	4.0E-01	mg/m3	3.4E-02
				Dichlorodifluoromethane	7.9E+02	µg/m^3	1.1E-05	mg/m^3	NA	NA	NA	2.3E-02	mg/m^3	1.0E+00	mg/m3	2.3E-02
				Trichloroethene	3.9E+02	µg/m^3	5.2E-06	mg/m^3	4.1E-06	1/(ug/m3)	2.1E-08	1.1E-02	mg/m^3	2.0E-03	mg/m3	5.5E+00
			Exp. Route Total								2.8E-08					5.8E+00
		Exposure Point Total									2.8E-08					5.8E+00
	Exposure Medium Total										2.8E-08					5.8E+00
Groundwater Total											3.7E-08					6.0E+00
Receptor Total											4E-08					6E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.9.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,3-Dinitrobenzene	2.8E+00	1.7E-03	8.7E-03	9.2E-01	2.2E+00	1.0E+00	1.0	1.3E-08	1
2,6-Dinitrotoluene	1.0E+00	3.7E-03	1.9E-02	1.1E+00	2.6E+00	1.0E+00	1.0	1.1E-08	1
2-Amino-4,6-dinitrotoluene	5.1E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	1.0	3.3E-09	1
4-Amino-2,6-dinitrotoluene	1.1E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	1.0	7.2E-09	1
HMX	4.5E+02	4.4E-05	2.9E-04	4.8E+00	1.1E+01	1.0E+00	1.0	1.2E-07	1
RDX	9.4E+02	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	1.0	1.2E-06	1
Barium	6.4E+02	1.0E-03	NA	NA	NA	NA	1.0	6.4E-07	1
Naphthalene	2.7E-01	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	1.0	2.6E-08	1
1,1,2-Trichlorotrifluoroethane (Freon 113)	2.8E+04	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	1.0	1.5E-03	1
1,1-Dichloroethane	3.5E+00	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	1.0	4.1E-08	2
1,1-Dichloroethene	2.9E+01	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	1.0	5.9E-07	2
Bromomethane	8.4E+00	2.8E-03	1.1E-02	3.6E-01	8.6E-01	1.0E+00	1.0	4.1E-08	2
Chloroform	2.2E+00	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	1.0	2.9E-08	2
cis-1,2-Dichloroethene	5.7E+01	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	1.0	1.1E-06	3
Dichlorodifluoromethane	2.3E+02	9.0E-03	3.8E-02	5.0E-01	1.2E+00	1.0E+00	1.0	4.0E-06	2
Trichloroethene	5.4E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	1.0	1.3E-06	2

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 1)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + 3B^2)/(1+B)^2)) xCF1 x CF2 (Eq 2)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.10.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (F	2.5E+06	µg/m^3	NA	NA	NA	NA	NA	2.4E+03	mg/m^3	5.0E+00	mg/m3	4.7E+02
				1,1-Dichloroethene	5.6E+01	µg/m^3	NA	NA	NA	NA	NA	5.3E-02	mg/m^3	2.0E-01	mg/m3	2.7E-01
				Bromomethane	1.8E+00	µg/m^3	NA	NA	NA	NA	NA	1.7E-03	mg/m^3	5.0E-03	mg/m3	3.4E-01
				Chloroform	1.9E+00	µg/m^3	NA	NA	NA	NA	NA	1.9E-03	mg/m^3	9.8E-02	mg/m3	1.9E-02
				cis-1,2-Dichloroethene	5.7E+00	µg/m^3	NA	NA	NA	NA	NA	5.5E-03	mg/m^3	4.0E-02	mg/m3	1.4E-01
				Dichlorodifluoromethane	2.5E+03	µg/m^3	NA	NA	NA	NA	NA	2.4E+00	mg/m^3	1.0E-01	mg/m3	2.4E+01
				Trichloroethene	1.3E+01	µg/m^3	NA	NA	NA	NA	NA	1.2E-02	mg/m^3	2.0E-03	mg/m3	6.0E+00
			Exp. Route Total								NA					5.0E+02
		Exposure Point Total									NA					5.0E+02
	Exposure Medium Total										NA					5.0E+02
	Tapwater	Tapwater	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	NA	NA	NA	NA	NA	8.4E-05	mg/kg/day	1.0E-04	mg/kg/day	8.4E-01
				2,6-Dinitrotoluene	1.0E+00	µg/L	NA	NA	NA	NA	NA	3.0E-05	mg/kg/day	3.0E-04	mg/kg/day	1.0E-01
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	NA	NA	NA	NA	NA	1.6E-05	mg/kg/day	1.0E-04	mg/kg/day	1.6E-01
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	NA	NA	NA	NA	NA	3.3E-05	mg/kg/day	1.0E-04	mg/kg/day	3.3E-01
				HMX	4.5E+02	µg/L	NA	NA	NA	NA	NA	1.3E-02	mg/kg/day	5.0E-02	mg/kg/day	2.7E-01
				RDX	9.4E+02	µg/L	NA	NA	NA	NA	NA	2.8E-02	mg/kg/day	4.0E-03	mg/kg/day	7.0E+00
				Arsenic	3.7E+01	µg/L	NA	NA	NA	NA	NA	1.1E-03	mg/kg/day	3.0E-04	mg/kg/day	3.7E+00
				Barium	9.6E+02	µg/L	NA	NA	NA	NA	NA	2.9E-02	mg/kg/day	2.0E-01	mg/kg/day	1.4E-01
				Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	9.6E-05	mg/kg/day	2.0E-02	mg/kg/day	4.8E-03
				1,1,2-Trichlorotrifluoroethane (F	1.8E+05	µg/L	NA	NA	NA	NA	NA	5.4E+00	mg/kg/day	3.0E+01	mg/kg/day	1.8E-01
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	1.0E-04	mg/kg/day	2.0E-01	mg/kg/day	5.2E-04
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	2.4E-03	mg/kg/day	5.0E-02	mg/kg/day	4.7E-02
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	1.4E-05	mg/kg/day	4.0E-03	mg/kg/day	3.5E-03
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	2.5E-04	mg/kg/day	1.4E-03	mg/kg/day	1.8E-01
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	6.3E-04	mg/kg/day	1.0E-02	mg/kg/day	6.3E-02
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	2.0E-03	mg/kg/day	8.5E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	6.9E-03	mg/kg/day	2.0E-01	mg/kg/day	3.4E-02
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	5.7E-05	mg/kg/day	1.0E-01	mg/kg/day	5.7E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	1.6E-03	mg/kg/day	5.0E-04	mg/kg/day	3.2E+00
			Exp. Route Total								NA					1.7E+01

TABLE 7.10.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	1,3-Dinitrobenzene	2.8E+00	µg/L	NA	NA	NA	NA	NA	2.6E-06	mg/kg/day	1.0E-04	mg/kg/day	2.6E-02
				2,6-Dinitrotoluene	1.0E+00	µg/L	NA	NA	NA	NA	NA	2.1E-06	mg/kg/day	3.0E-04	mg/kg/day	7.1E-03
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	NA	NA	NA	NA	NA	7.0E-07	mg/kg/day	1.0E-04	mg/kg/day	7.0E-03
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	NA	NA	NA	NA	NA	1.4E-06	mg/kg/day	1.0E-04	mg/kg/day	1.4E-02
				HMX	4.5E+02	µg/L	NA	NA	NA	NA	NA	2.4E-05	mg/kg/day	5.0E-02	mg/kg/day	4.7E-04
				RDX	9.4E+02	µg/L	NA	NA	NA	NA	NA	2.4E-04	mg/kg/day	4.0E-03	mg/kg/day	5.9E-02
				Arsenic	3.7E+01	µg/L	NA	NA	NA	NA	NA	6.2E-06	mg/kg/day	3.0E-04	mg/kg/day	2.1E-02
				Barium	9.6E+02	µg/L	NA	NA	NA	NA	NA	1.6E-04	mg/kg/day	1.4E-02	mg/kg/day	1.1E-02
				Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	6.1E-05	mg/kg/day	2.0E-02	mg/kg/day	3.0E-03
				1,1,2-Trichlorotrifluoroethane (F	1.8E+05	µg/L	NA	NA	NA	NA	NA	1.9E+00	mg/kg/day	3.0E+01	mg/kg/day	6.3E-02
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	8.0E-06	mg/kg/day	2.0E-01	mg/kg/day	4.0E-05
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	3.1E-04	mg/kg/day	5.0E-02	mg/kg/day	6.1E-03
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	2.1E-06	mg/kg/day	4.0E-03	mg/kg/day	5.3E-04
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	7.8E-06	mg/kg/day	1.4E-03	mg/kg/day	5.6E-03
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	5.5E-05	mg/kg/day	1.0E-02	mg/kg/day	5.5E-03
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.1E-04	mg/kg/day	2.0E-03	mg/kg/day	1.0E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	8.0E-04	mg/kg/day	2.0E-01	mg/kg/day	4.0E-03
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	3.3E-05	mg/kg/day	1.0E-01	mg/kg/day	3.3E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	2.6E-04	mg/kg/day	5.0E-04	mg/kg/day	5.2E-01
			Exp. Route Total								NA					8.6E-01
		Exposure Point Total									NA					1.8E+01
	Exposure Medium Total										NA					1.8E+01

TABLE 7.10.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	1.5E-03	mg/m^3	3.0E-03	mg/m3	5.1E-01
				1,1,2-Trichlorotrifluoroethane (F	1.8E+05	µg/L	NA	NA	NA	NA	NA	8.6E+01	mg/m^3	5.0E+00	mg/m3	1.7E+01
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	3.8E-02	mg/m^3	2.0E-01	mg/m3	1.9E-01
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	2.3E-04	mg/m^3	3.0E-02	mg/m3	7.5E-03
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	4.0E-03	mg/m^3	5.0E-03	mg/m3	8.1E-01
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	1.0E-02	mg/m^3	9.8E-02	mg/m3	1.0E-01
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.7E-02	mg/m^3	4.0E-02	mg/m3	6.8E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	1.1E-01	mg/m^3	1.0E-01	mg/m3	1.1E+00
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	9.1E-04	mg/m^3	1.0E+00	mg/m3	9.1E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	2.6E-02	mg/m^3	2.0E-03	mg/m3	1.3E+01
			Exp. Route Total								NA					3.4E+01
		Exposure Point Total									NA					3.4E+01
	Exposure Medium Total										NA					3.4E+01
Groundwater Total											NA					5.6E+02
Receptor Total											NA					6E+02

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
$µg/m^3$= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.10.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,3-Dinitrobenzene	2.8E+00	1.7E-03	8.7E-03	9.2E-01	2.2E+00	1.0E+00	0.71	1.1E-08	2
2,6-Dinitrotoluene	1.0E+00	3.7E-03	1.9E-02	1.1E+00	2.6E+00	1.0E+00	0.71	9.0E-09	2
2-Amino-4,6-dinitrotoluene	5.4E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	3.0E-09	2
4-Amino-2,6-dinitrotoluene	1.1E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	6.0E-09	2
HMX	4.5E+02	4.4E-05	2.9E-04	4.8E+00	1.1E+01	1.0E+00	0.71	1.0E-07	2
RDX	9.4E+02	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.71	1.0E-06	2
Arsenic	3.7E+01	1.0E-03	NA	NA	NA	NA	0.71	2.6E-08	1
Barium	9.6E+02	1.0E-03	NA	NA	NA	NA	0.71	6.8E-07	1
Naphthalene	3.2E+00	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.71	2.6E-07	2
1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.71	8.0E-03	2
1,1-Dichloroethane	3.5E+00	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.71	3.4E-08	2
1,1-Dichloroethene	7.9E+01	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.71	1.3E-06	2
Benzene	4.7E-01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.71	9.0E-09	3
Bromomethane	8.4E+00	2.8E-03	1.1E-02	3.6E-01	8.6E-01	1.0E+00	0.71	3.3E-08	2
Chloroform	2.1E+01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.71	2.3E-07	2
cis-1,2-Dichloroethene	5.7E+01	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.71	8.8E-07	2
Dichlorodifluoromethane	2.3E+02	9.0E-03	3.8E-02	5.0E-01	1.2E+00	1.0E+00	0.71	3.4E-06	2
Ethylbenzene	1.9E+00	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.71	1.4E-07	2
Trichloroethene	5.4E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.71	1.1E-06	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.11.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon	2.5E+06	μg/m^3	NA	NA	NA	NA	NA	2.4E+03	mg/m^3	5.0E+00	mg/m3	4.7E+02
				1,1-Dichloroethene	5.6E+01	μg/m^3	NA	NA	NA	NA	NA	5.3E-02	mg/m^3	2.0E-01	mg/m3	2.7E-01
				Bromomethane	1.8E+00	μg/m^3	NA	NA	NA	NA	NA	1.7E-03	mg/m^3	5.0E-03	mg/m3	3.4E-01
				Chloroform	1.9E+00	μg/m^3	NA	NA	NA	NA	NA	1.9E-03	mg/m^3	9.8E-02	mg/m3	1.9E-02
				cis-1,2-Dichloroethene	5.7E+00	μg/m^3	NA	NA	NA	NA	NA	5.5E-03	mg/m^3	4.0E-02	mg/m3	1.4E-01
				Dichlorodifluoromethane	2.5E+03	μg/m^3	NA	NA	NA	NA	NA	2.4E+00	mg/m^3	1.0E-01	mg/m3	2.4E+01
				Trichloroethene	1.3E+01	μg/m^3	NA	NA	NA	NA	NA	1.2E-02	mg/m^3	2.0E-03	mg/m3	6.0E+00
			Exp. Route Total								NA					5.0E+02
		Exposure Point Total									NA					5.0E+02
	Exposure Medium Total										NA					5.0E+02
	Tapwater	Tapwater	Ingestion	1,3-Dinitrobenzene	2.8E+00	μg/L	NA	NA	NA	NA	NA	1.4E-04	mg/kg/day	1.0E-04	mg/kg/day	1.4E+00
				2,6-Dinitrotoluene	1.0E+00	μg/L	NA	NA	NA	NA	NA	5.0E-05	mg/kg/day	3.0E-04	mg/kg/day	1.7E-01
				2-Amino-4,6-dinitrotoluene	5.4E-01	μg/L	NA	NA	NA	NA	NA	2.7E-05	mg/kg/day	1.0E-04	mg/kg/day	2.7E-01
				4-Amino-2,6-dinitrotoluene	1.1E+00	μg/L	NA	NA	NA	NA	NA	5.5E-05	mg/kg/day	1.0E-04	mg/kg/day	5.5E-01
				HMX	4.5E+02	μg/L	NA	NA	NA	NA	NA	2.2E-02	mg/kg/day	5.0E-02	mg/kg/day	4.5E-01
				RDX	9.4E+02	μg/L	NA	NA	NA	NA	NA	4.7E-02	mg/kg/day	4.0E-03	mg/kg/day	1.2E+01
				Arsenic	3.7E+01	μg/L	NA	NA	NA	NA	NA	1.8E-03	mg/kg/day	3.0E-04	mg/kg/day	6.1E+00
				Barium	9.6E+02	μg/L	NA	NA	NA	NA	NA	4.8E-02	mg/kg/day	2.0E-01	mg/kg/day	2.4E-01
				Naphthalene	3.2E+00	μg/L	NA	NA	NA	NA	NA	1.6E-04	mg/kg/day	2.0E-02	mg/kg/day	8.0E-03
				1,1,2-Trichlorotrifluoroethane (Freon	1.8E+05	μg/L	NA	NA	NA	NA	NA	9.0E+00	mg/kg/day	3.0E+01	mg/kg/day	3.0E-01
				1,1-Dichloroethane	3.5E+00	μg/L	NA	NA	NA	NA	NA	1.7E-04	mg/kg/day	2.0E-01	mg/kg/day	8.7E-04
				1,1-Dichloroethene	7.9E+01	μg/L	NA	NA	NA	NA	NA	3.9E-03	mg/kg/day	5.0E-02	mg/kg/day	7.9E-02
				Benzene	4.7E-01	μg/L	NA	NA	NA	NA	NA	2.3E-05	mg/kg/day	4.0E-03	mg/kg/day	5.9E-03
				Bromomethane	8.4E+00	μg/L	NA	NA	NA	NA	NA	4.2E-04	mg/kg/day	1.4E-03	mg/kg/day	3.0E-01
				Chloroform	2.1E+01	μg/L	NA	NA	NA	NA	NA	1.0E-03	mg/kg/day	1.0E-02	mg/kg/day	1.0E-01
				cis-1,2-Dichloroethene	5.7E+01	μg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	2.0E-03	mg/kg/day	1.4E+00
				Dichlorodifluoromethane	2.3E+02	μg/L	NA	NA	NA	NA	NA	1.1E-02	mg/kg/day	2.0E-01	mg/kg/day	5.7E-02
				Ethylbenzene	1.9E+00	μg/L	NA	NA	NA	NA	NA	9.5E-05	mg/kg/day	1.0E-01	mg/kg/day	9.5E-04
				Trichloroethene	5.4E+01	μg/L	NA	NA	NA	NA	NA	2.7E-03	mg/kg/day	5.0E-04	mg/kg/day	5.4E+00
			Exp. Route Total								NA					2.9E+01

TABLE 7.11.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Intake/Exposure Concentration Value	Cancer Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Intake/Exposure Concentration Value	Non-Cancer Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater	Tapwater	Tapwater	Dermal	1,3-Dinitrobenzene	2.80E+00	µg/L	NA	NA	NA	NA	NA	3.9E-06	mg/kg/day	1.0E-04	mg/kg/day	3.9E-02
(cont.)				2,6-Dinitrotoluene	1.00E+00	µg/L	NA	NA	NA	NA	NA	3.2E-06	mg/kg/day	3.0E-04	mg/kg/day	1.1E-02
				2-Amino-4,6-dinitrotoluene	5.40E-01	µg/L	NA	NA	NA	NA	NA	1.1E-06	mg/kg/day	1.0E-04	mg/kg/day	1.1E-02
				4-Amino-2,6-dinitrotoluene	1.10E+00	µg/L	NA	NA	NA	NA	NA	2.1E-06	mg/kg/day	1.0E-04	mg/kg/day	2.1E-02
				HMX	4.50E+02	µg/L	NA	NA	NA	NA	NA	3.5E-05	mg/kg/day	5.0E-02	mg/kg/day	7.1E-04
				RDX	9.40E+02	µg/L	NA	NA	NA	NA	NA	3.5E-04	mg/kg/day	4.0E-03	mg/kg/day	8.9E-02
				Arsenic	3.70E+01	µg/L	NA	NA	NA	NA	NA	8.1E-06	mg/kg/day	3.0E-04	mg/kg/day	2.7E-02
				Barium	9.60E+02	µg/L	NA	NA	NA	NA	NA	2.1E-04	mg/kg/day	1.4E-02	mg/kg/day	1.5E-02
				Naphthalene	3.20E+00	µg/L	NA	NA	NA	NA	NA	9.1E-05	mg/kg/day	2.0E-02	mg/kg/day	4.6E-03
				1,1,2-Trichlorotrifluoroethane (Freon	1.80E+05	µg/L	NA	NA	NA	NA	NA	2.8E+00	mg/kg/day	3.0E+01	mg/kg/day	9.4E-02
				1,1-Dichloroethane	3.50E+00	µg/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	2.0E-01	mg/kg/day	6.0E-05
				1,1-Dichloroethene	7.90E+01	µg/L	NA	NA	NA	NA	NA	4.6E-04	mg/kg/day	5.0E-02	mg/kg/day	9.3E-03
				Benzene	4.70E-01	µg/L	NA	NA	NA	NA	NA	3.1E-06	mg/kg/day	4.0E-03	mg/kg/day	7.8E-04
				Bromomethane	8.40E+00	µg/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	1.4E-03	mg/kg/day	8.4E-03
				Chloroform	2.10E+01	µg/L	NA	NA	NA	NA	NA	8.3E-05	mg/kg/day	1.0E-02	mg/kg/day	8.3E-03
				cis-1,2-Dichloroethene	5.70E+01	µg/L	NA	NA	NA	NA	NA	3.1E-04	mg/kg/day	2.0E-03	mg/kg/day	1.6E-01
				Dichlorodifluoromethane	2.30E+02	µg/L	NA	NA	NA	NA	NA	1.2E-03	mg/kg/day	2.0E-01	mg/kg/day	6.0E-03
				Ethylbenzene	1.90E+00	µg/L	NA	NA	NA	NA	NA	5.0E-05	mg/kg/day	1.0E-01	mg/kg/day	5.0E-04
				Trichloroethene	5.40E+01	µg/L	NA	NA	NA	NA	NA	3.9E-04	mg/kg/day	5.0E-04	mg/kg/day	7.8E-01
			Exp. Route Total								NA					1.3E+00
		Exposure Point Total									NA					3.0E+01
	Exposure Medium Total										NA					3.0E+01

TABLE 7.11.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Naphthalene	3.2E+00	µg/L	NA	NA	NA	NA	NA	1.5E-03	mg/m^3	3.0E-03	mg/m3	5.1E-01
				1,1,2-Trichlorotrifluoroethane (Freon	1.8E+05	µg/L	NA	NA	NA	NA	NA	8.6E+01	mg/m^3	5.0E+00	mg/m3	1.7E+01
				1,1-Dichloroethane	3.5E+00	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	NA	NA	NA	NA	NA	3.8E-02	mg/m^3	2.0E-01	mg/m3	1.9E-01
				Benzene	4.7E-01	µg/L	NA	NA	NA	NA	NA	2.3E-04	mg/m^3	3.0E-02	mg/m3	7.5E-03
				Bromomethane	8.4E+00	µg/L	NA	NA	NA	NA	NA	4.0E-03	mg/m^3	5.0E-03	mg/m3	8.1E-01
				Chloroform	2.1E+01	µg/L	NA	NA	NA	NA	NA	1.0E-02	mg/m^3	9.8E-02	mg/m3	1.0E-01
				cis-1,2-Dichloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.7E-02	mg/m^3	4.0E-02	mg/m3	6.8E-01
				Dichlorodifluoromethane	2.3E+02	µg/L	NA	NA	NA	NA	NA	1.1E-01	mg/m^3	1.0E-01	mg/m3	1.1E+00
				Ethylbenzene	1.9E+00	µg/L	NA	NA	NA	NA	NA	9.1E-04	mg/m^3	1.0E+00	mg/m3	9.1E-04
				Trichloroethene	5.4E+01	µg/L	NA	NA	NA	NA	NA	2.6E-02	mg/m^3	2.0E-03	mg/m3	1.3E+01
			Exp. Route Total								NA					3.4E+01
		Exposure Point Total									NA					3.4E+01
	Exposure Medium Total										NA					3.4E+01
Groundwater Total											NA					5.7E+02
Receptor Total											NA					6E+02

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.11.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,3-Dinitrobenzene	2.8E+00	1.7E-03	8.7E-03	9.2E-01	2.2E+00	1.0E+00	0.54	9.5E-09	2
2,6-Dinitrotoluene	1.0E+00	3.7E-03	1.9E-02	1.1E+00	2.6E+00	1.0E+00	0.54	7.9E-09	2
2-Amino-4,6-dinitrotoluene	5.4E-01	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	2.6E-09	2
4-Amino-2,6-dinitrotoluene	1.1E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	5.3E-09	2
HMX	4.5E+02	4.4E-05	2.9E-04	4.8E+00	1.1E+01	1.0E+00	0.54	8.7E-08	2
RDX	9.4E+02	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.54	8.7E-07	2
Arsenic	3.7E+01	1.0E-03	NA	NA	NA	NA	0.54	2.0E-08	1
Barium	9.6E+02	1.0E-03	NA	NA	NA	NA	0.54	5.2E-07	1
Naphthalene	3.2E+00	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.54	2.2E-07	2
1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.54	6.9E-03	2
1,1-Dichloroethane	3.5E+00	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.54	2.9E-08	2
1,1-Dichloroethene	7.9E+01	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.54	1.1E-06	2
Benzene	4.7E-01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.54	7.6E-09	2
Bromomethane	8.4E+00	2.8E-03	1.1E-02	3.6E-01	8.6E-01	1.0E+00	0.54	2.9E-08	2
Chloroform	2.1E+01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.54	2.0E-07	2
cis-1,2-Dichloroethene	5.7E+01	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.54	7.7E-07	2
Dichlorodifluoromethane	2.3E+02	9.0E-03	3.8E-02	5.0E-01	1.2E+00	1.0E+00	0.54	3.0E-06	2
Ethylbenzene	1.9E+00	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.54	1.2E-07	2
Trichloroethene	5.4E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.54	9.6E-07	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.12.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.5E+06	µg/m^3	8.8E+02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,1-Dichloroethene	5.6E+01	µg/m^3	2.0E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Bromomethane	1.8E+00	µg/m^3	6.3E-04	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	1.9E+00	µg/m^3	6.9E-04	mg/m^3	2.3E-05	1/(ug/m3)	1.6E-05	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	5.7E+00	µg/m^3	2.0E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Dichlorodifluoromethane	2.5E+03	µg/m^3	8.9E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	1.3E+01	µg/m^3	4.5E-03	mg/m^3	4.1E-06	1/(ug/m3)	2.6E-05	NA	NA	NA	NA	NA
			Exp. Route Total								4.2E-05					NA
		Exposure Point Total									4.2E-05					NA
	Exposure Medium Total										4.2E-05					NA
	Tapwater	Tapwater	Ingestion	1,3-Dinitrobenzene	2.8E+00	µg/L	3.6E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				2,6-Dinitrotoluene	1.0E+00	µg/L	1.3E-05	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.9E-05	NA	NA	NA	NA	NA
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	6.9E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	1.4E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				HMX	4.5E+02	µg/L	5.8E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	9.4E+02	µg/L	1.2E-02	mg/kg/day	8.0E-02	1/(mg/kg/day)	9.7E-04	NA	NA	NA	NA	NA
				Arsenic	3.7E+01	µg/L	4.7E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	7.1E-04	NA	NA	NA	NA	NA
				Barium	9.6E+02	µg/L	1.2E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Naphthalene	3.2E+00	µg/L	4.1E-05	mg/kg/day	1.2E-01	1/(mg/kg/day)	4.9E-06	NA	NA	NA	NA	NA
				1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	µg/L	2.3E+00	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1-Dichloroethane	3.5E+00	µg/L	4.5E-05	mg/kg/day	5.7E-03	1/(mg/kg/day)	2.6E-07	NA	NA	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	1.0E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	4.7E-01	µg/L	6.0E-06	mg/kg/day	5.5E-02	1/(mg/kg/day)	3.3E-07	NA	NA	NA	NA	NA
				Bromomethane	8.4E+00	µg/L	1.1E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	2.1E+01	µg/L	2.7E-04	mg/kg/day	3.1E-02	1/(mg/kg/day)	8.4E-06	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	5.7E+01	µg/L	7.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Dichlorodifluoromethane	2.3E+02	µg/L	3.0E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	1.9E+00	µg/L	2.4E-05	mg/kg/day	1.1E-02	1/(mg/kg/day)	2.7E-07	NA	NA	NA	NA	NA
				Trichloroethene	5.4E+01	µg/L	6.9E-04	mg/kg/day	4.6E-02	1/(mg/kg/day)	4.5E-05	NA	NA	NA	NA	NA
			Exp. Route Total								1.8E-03					NA

TABLE 7.12.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	1,3-Dinitrobenzene	2.8E+00	µg/L	1.1E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				2,6-Dinitrotoluene	1.0E+00	µg/L	8.8E-07	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.3E-06	NA	NA	NA	NA	NA
				2-Amino-4,6-dinitrotoluene	5.4E-01	µg/L	2.9E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				4-Amino-2,6-dinitrotoluene	1.1E+00	µg/L	5.9E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				HMX	4.5E+02	µg/L	9.8E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	9.4E+02	µg/L	9.8E-05	mg/kg/day	8.0E-02	1/(mg/kg/day)	7.8E-06	NA	NA	NA	NA	NA
				Arsenic	3.7E+01	µg/L	2.5E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	3.7E-06	NA	NA	NA	NA	NA
				Barium	9.6E+02	µg/L	6.4E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Naphthalene	3.2E+00	µg/L	2.5E-05	mg/kg/day	1.2E-01	1/(mg/kg/day)	3.0E-06	NA	NA	NA	NA	NA
				1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	µg/L	7.8E-01	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1-Dichloroethane	3.5E+00	µg/L	3.3E-06	mg/kg/day	5.7E-03	1/(mg/kg/day)	1.9E-08	NA	NA	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	1.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	4.7E-01	µg/L	8.7E-07	mg/kg/day	5.5E-02	1/(mg/kg/day)	4.8E-08	NA	NA	NA	NA	NA
				Bromomethane	8.4E+00	µg/L	3.2E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	2.1E+01	µg/L	2.3E-05	mg/kg/day	3.1E-02	1/(mg/kg/day)	7.1E-07	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	5.7E+01	µg/L	8.6E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Dichlorodifluoromethane	2.3E+02	µg/L	3.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	1.9E+00	µg/L	1.4E-05	mg/kg/day	1.1E-02	1/(mg/kg/day)	1.5E-07	NA	NA	NA	NA	NA
				Trichloroethene	5.4E+01	µg/L	1.1E-04	mg/kg/day	4.6E-02	1/(mg/kg/day)	5.4E-06	NA	NA	NA	NA	NA
			Exp. Route Total								2.2E-05					NA
		Exposure Point Total									1.8E-03					NA
	Exposure Medium Total										1.8E-03					NA

TABLE 7.12.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Naphthalene	3.2E+00	µg/L	5.7E-04	mg/m^3	3.4E-05	1/(µg/m3)	1.9E-05	NA	NA	NA	NA	NA
				1,1,2-Trichlorotrifluoroethane (Freon 113)	1.8E+05	µg/L	3.2E+01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,1-Dichloroethane	3.5E+00	µg/L	6.2E-04	mg/m^3	1.6E-06	1/(µg/m3)	1.0E-06	NA	NA	NA	NA	NA
				1,1-Dichloroethene	7.9E+01	µg/L	1.4E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	4.7E-01	µg/L	8.4E-05	mg/m^3	7.8E-06	1/(µg/m3)	6.5E-07	NA	NA	NA	NA	NA
				Bromomethane	8.4E+00	µg/L	1.5E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	2.1E+01	µg/L	3.7E-03	mg/m^3	2.3E-05	1/(µg/m3)	8.6E-05	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	5.7E+01	µg/L	1.0E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Dichlorodifluoromethane	2.3E+02	µg/L	4.1E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	1.9E+00	µg/L	3.4E-04	mg/m^3	2.5E-06	1/(µg/m3)	8.5E-07	NA	NA	NA	NA	NA
				Trichloroethene	5.4E+01	µg/L	9.6E-03	mg/m^3	4.1E-06	1/(µg/m3)	5.6E-05	NA	NA	NA	NA	NA
			Exp. Route Total								1.6E-04					NA
		Exposure Point Total									1.6E-04					NA
	Exposure Medium Total										1.6E-04					NA
Groundwater Total											2.0E-03					NA
Receptor Total											2E-03					NA

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
$µg/m^3$= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.12.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations											
							Intake					CSF/Unit Risk					Cancer Risk
					Value	Units	Value				Units	Value				Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)		
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	1.3E-02	mg/m^3	3.5E-04	6.9E-04	1.7E-03	1.7E-03	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	$1/(\mu g/m^3)$	1E-05
	Groundwater	Tapwater	Ingestion	Trichloroethene	5.4E+01	ug/L	7.7E-05	1.5E-04	2.3E-04	2.3E-04	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	1/(mg/kg-day)	2E-05
			Dermal	Trichloroethene	5.4E+01	ug/L	1.1E-05	2.2E-05	3.7E-05	3.7E-05	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	1/(mg/kg-day)	3E-06
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Trichloroethene	5.4E+01	ug/L	7.4E-04	1.5E-03	3.7E-03	3.7E-03	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	$1/(\mu g/m^3)$	3E-05

Notes:
(1) Continuous lifetime exposure to vinyl chloride from birth.
(2) Continuous lifetime exposure to vinyl chloride during adulthood.
ADAF = Age-dependent adjustment factor
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
$\mu g/m^3$= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.12.RME SUPPLEMENT B

CALCULATION OF CHEMICAL CANCER RISKS FOR TRICHLOROETHENE

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	(1)
Groundwater	Indoor Air	Indoor Air	Inhalation	Trichloroethene (Kidney)	1.3E-02	mg/m^3	(2)	mg/m^3	1.0E-06	1/(µg/m3)	1E-05
				Trichloroethene (NHL + Liver)	1.3E-02	mg/m^3	4.5E-03	mg/m^3	3.1E-06	1/(µg/m3)	1E-05
			Exp. Route Total								3E-05
	Tapwater	Tapwater	Ingestion	Trichloroethene (Kidney)	5.4E+01	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	2E-05
				Trichloroethene (NHL + Liver)	5.4E+01	µg/L	6.9E-04	mg/kg/day	3.7E-02	1/(mg/kg/day)	3E-05
			Exp. Route Total								5E-05
			Dermal	Trichloroethene (Kidney)	5.4E+01	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	3E-06
				Trichloroethene (NHL + Liver)	5.4E+01	µg/L	6.4E-05	mg/kg/day	3.7E-02	1/(mg/kg/day)	2E-06
			Exp. Route Total								5E-06
	Household Air	Household Air	Inhalation	Trichloroethene (Kidney)	5.4E+01	µg/L	(2)	mg/m^3	1.0E-06	1/(µg/m3)	3E-05
				Trichloroethene (NHL + Liver)	5.4E+01	µg/L	9.6E-03	mg/m^3	3.1E-06	1/(µg/m3)	3E-05
			Exp. Route Total								6E-05

Notes:

(1) Carcinogenic risks were estimated for trichloroethene by summing the risks for two different approaches: 1) Using the oral CSF factor for kidney cancer, which has a mutagenic mode of action (calculated in Table 7.8 RME Supplement A), and 2) using the CSF for non-Hodgkin lymphoma (NHL) and liver cancer.

(2) Intakes and exposure concentrations using the toxicity values for the kidney component of TCE were estimated on Table 7.8 RME Supplement A.

CSF = Cancer slope factor

µg/L = microgram per liter

mg/m^3= milligram per cubic meter

mg/kg/day = milligram per kilogram per day

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+02	NA	5E+02
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	3E-01	NA	3E-01
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	3E-01	NA	3E-01
			Chloroform	NA	NA	NA	NA	Hepatic	NA	2E-02	NA	2E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	1E-01	NA	1E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	2E+01	NA	2E+01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	8E-01	NA	3E-02	9E-01
			2,6-Dinitrotoluene	NA	NA	NA	NA	Spleen	1E-01	NA	7E-03	1E-01
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	2E-01	NA	7E-03	2E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	3E-01	NA	1E-02	3E-01
			HMX	NA	NA	NA	NA	Hepatic	3E-01	NA	5E-04	3E-01
			RDX	NA	NA	NA	NA	Nervous	7E+00	NA	6E-02	7E+00
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	4E+00	NA	2E-02	4E+00
			Barium	NA	NA	NA	NA	Urinary	1E-01	NA	1E-02	2E-01
			Cadmium	NA	NA	NA	NA	Urinary	2E-01	NA	2E-02	2E-01
			Naphthalene	NA	NA	NA	NA	Whole body	5E-03	NA	3E-03	8E-03
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	2E-01	NA	6E-02	2E-01
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	5E-04	NA	4E-05	6E-04
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	5E-02	NA	6E-03	5E-02
			Benzene	NA	NA	NA	NA	Immune	4E-03	NA	5E-04	4E-03
			Bromomethane	NA	NA	NA	NA	Gastrointestinal	2E-01	NA	6E-03	2E-01
			Chloroform	NA	NA	NA	NA	Hepatic	6E-02	NA	6E-03	7E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	9E-01	NA	1E-01	1E+00
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole body	3E-02	NA	4E-03	4E-02
			Ethylbenzene	NA	NA	NA	NA	Hepatic, Urinary	6E-04	NA	3E-04	9E-04
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	3E+00	NA	5E-01	4E+00

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
		Exposure Point Total		NA	NA	NA	NA		2E+01	NA	9E-01	2E+01
	Exposure Medium Total			NA	NA	NA	NA		2E+01	NA	9E-01	2E+01
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	5E-01	NA	5E-01
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E+01	NA	2E+01
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			Benzene	NA	NA	NA	NA	Immune	NA	8E-03	NA	8E-03
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	8E-01	NA	8E-01
			Chloroform	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	7E-01	NA	7E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	1E+00	NA	1E+00
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	9E-04	NA	9E-04
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	1E+01	NA	1E+01
		Exposure Point Total		NA	NA	NA	NA		NA	3E+01	NA	3E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E+01	NA	3E+01
Groundwater Total				NA	NA	NA	NA		2E+01	5E+02	9E-01	6E+02
Receptor Total				NA	NA	NA	NA		2E+01	5E+02	9E-01	6E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**26**
Total Dermal HI Across Media =	**4**
Total Developmental HI Across Media =	**23**
Total Hepatic HI Across Media =	1
Total Immune HI Across Media =	**24**
Total Nervous HI Across Media =	**9**
Total Respiratory HI Across Media =	**2**
Total Urinary HI Across Media =	1
Total Whole body HI Across Media =	**25**
Total Gastrointestinal HI Across Media =	0.2
Total NOE HI Across Media =	**491**

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (	NA	NA	NA	NA	NOE	NA	5E+02	NA	5E+02
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	3E-01	NA	3E-01
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	3E-01	NA	3E-01
			Chloroform	NA	NA	NA	NA	Hepatic	NA	2E-02	NA	2E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	1E-01	NA	1E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	2E+01	NA	2E+01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	1E+00	NA	4E-02	1E+00
			2,6-Dinitrotoluene	NA	NA	NA	NA	Spleen	2E-01	NA	1E-02	2E-01
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	3E-01	NA	1E-02	3E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	5E-01	NA	2E-02	6E-01
			HMX	NA	NA	NA	NA	Hepatic	4E-01	NA	7E-04	4E-01
			RDX	NA	NA	NA	NA	Nervous	1E+01	NA	9E-02	1E+01
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	6E+00	NA	3E-02	6E+00
			Barium	NA	NA	NA	NA	Urinary	2E-01	NA	2E-02	3E-01
			Cadmium	NA	NA	NA	NA	Urinary	3E-01	NA	3E-02	3E-01
			Naphthalene	NA	NA	NA	NA	Whole body	8E-03	NA	5E-03	1E-02
			1,1,2-Trichlorotrifluoroethane (	NA	NA	NA	NA	Nervous	3E-01	NA	9E-02	4E-01
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	9E-04	NA	6E-05	9E-04
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	8E-02	NA	9E-03	9E-02
			Benzene	NA	NA	NA	NA	Immune	6E-03	NA	8E-04	7E-03
			Bromomethane	NA	NA	NA	NA	Gastrointestinal	3E-01	NA	8E-03	3E-01
			Chloroform	NA	NA	NA	NA	Hepatic	1E-01	NA	8E-03	1E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	1E+00	NA	2E-01	2E+00
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole body	6E-02	NA	6E-03	6E-02
			Ethylbenzene	NA	NA	NA	NA	Hepatic, Urinary	9E-04	NA	5E-04	1E-03
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	5E+00	NA	8E-01	6E+00
		Exposure Point Total		NA	NA	NA	NA		3E+01	NA	1E+00	3E+01
	Exposure Medium Total			NA	NA	NA	NA		3E+01	NA	1E+00	3E+01

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	5E-01	NA	5E-01
			1,1,2-Trichlorotrifluoroethane (	NA	NA	NA	NA	NOE	NA	2E+01	NA	2E+01
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			Benzene	NA	NA	NA	NA	Immune	NA	8E-03	NA	8E-03
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	8E-01	NA	8E-01
			Chloroform	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	7E-01	NA	7E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	1E+00	NA	1E+00
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	9E-04	NA	9E-04
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	1E+01	NA	1E+01
		Exposure Point Total		NA	NA	NA	NA		NA	3E+01	NA	3E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E+01	NA	3E+01
Groundwater Total				NA	NA	NA	NA		3E+01	5E+02	1E+00	6E+02
Receptor Total				NA	NA	NA	NA		3E+01	5E+02	1E+00	6E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**31**
Total Dermal HI Across Media =	**6**
Total Developmental HI Across Media =	**25**
Total Hepatic HI Across Media =	**2**
Total Immune HI Across Media =	**27**
Total Nervous HI Across Media =	**14**
Total Respiratory HI Across Media =	**2**
Total Urinary HI Across Media =	**2**
Total Whole body HI Across Media =	**25**
Total Gastrointestinal HI Across Media =	0.3
Total NOE HI Across Media =	**491**

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Trichloroethene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
		Exposure Point Total		NA	4E-05	NA	4E-05		NA	NA	NA	NA
	Exposure Medium Total			NA	4E-05	NA	4E-05		NA	NA	NA	NA
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			2,6-Dinitrotoluene	2E-05	NA	1E-06	2E-05	NA	NA	NA	NA	NA
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA
			RDX	1E-03	NA	8E-06	1E-03	NA	NA	NA	NA	NA
			Arsenic	7E-04	NA	4E-06	7E-04	NA	NA	NA	NA	NA
			Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Naphthalene	5E-06	NA	3E-06	8E-06	NA	NA	NA	NA	NA
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethane	3E-07	NA	2E-08	3E-07	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	3E-07	NA	5E-08	4E-07	NA	NA	NA	NA	NA
			Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	8E-06	NA	7E-07	9E-06	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	3E-07	NA	2E-07	4E-07	NA	NA	NA	NA	NA
			Trichloroethene	5E-05	NA	5E-06	5E-05	NA	NA	NA	NA	NA
		Exposure Point Total		2E-03	NA	2E-05	2E-03		NA	NA	NA	NA
	Exposure Medium Total			2E-03	NA	2E-05	2E-03		NA	NA	NA	NA

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethane	NA	1E-06	NA	1E-06	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	NA	7E-07	NA	7E-07	NA	NA	NA	NA	NA
			Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	9E-05	NA	9E-05	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	NA	8E-07	NA	8E-07	NA	NA	NA	NA	NA
			Trichloroethene	NA	6E-05	NA	6E-05	NA	NA	NA	NA	NA
		Exposure Point Total		NA	2E-04	NA	2E-04		NA	NA	NA	NA
	Exposure Medium Total			NA	2E-04	NA	2E-04		NA	NA	NA	NA
Groundwater Total				2E-03	2E-04	2E-05	2E-03		NA	NA	NA	NA
Receptor Total				2E-03	2E-04	2E-05	2E-03		NA	NA	NA	NA

Notes: NA = Not applicable or not available

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	1E+02	NA	1E+02
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	6E-02	NA	6E-02
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	8E-02	NA	8E-02
			Chloroform	NA	4E-06	NA	4E-06	Hepatic	NA	5E-03	NA	5E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	3E-02	NA	3E-02
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	6E+00	NA	6E+00
			Trichloroethene	NA	4E-06	NA	4E-06	Developmental, Cardiovascular, Immune	NA	1E+00	NA	1E+00
		Exposure Point Total		NA	8E-06	NA	8E-06		NA	1E+02	NA	1E+02
	Exposure Medium Total			NA	8E-06	NA	8E-06		NA	1E+02	NA	1E+02
Groundwater Total				NA	8E-06	NA	8E-06		NA	1E+02	NA	1E+02
Receptor Total				NA	8E-06	NA	8E-06		NA	1E+02	NA	1E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	1
Total Developmental HI Across Media =	1
Total Hepatic HI Across Media =	0.07
Total Immune HI Across Media =	1
Total Nervous HI Across Media =	0.08
Total Respiratory HI Across Media =	0.08
Total Whole body HI Across Media =	**6**
Total NOE HI Across Media =	**113**

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	1E+02	NA	1E+02
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	6E-02	NA	6E-02
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	8E-02	NA	8E-02
			Chloroform	NA	4E-06	NA	4E-06	Hepatic	NA	5E-03	NA	5E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	3E-02	NA	3E-02
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	6E+00	NA	6E+00
			Trichloroethene	NA	4E-06	NA	4E-06	Developmental, Cardiovascular, Immune	NA	1E+00	NA	1E+00
		Exposure Point Total		NA	8E-06	NA	8E-06		NA	1E+02	NA	1E+02
	Exposure Medium Total			NA	8E-06	NA	8E-06		NA	1E+02	NA	1E+02
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	2E-01	NA	1E-03	2E-01
			2,6-Dinitrotoluene	5E-06	NA	6E-08	5E-06	Spleen	3E-02	NA	3E-04	3E-02
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	5E-02	NA	3E-04	5E-02
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	9E-02	NA	7E-04	9E-02
			HMX	NA	NA	NA	NA	Hepatic	8E-02	NA	2E-05	8E-02
			RDX	2E-04	NA	3E-07	2E-04	Nervous	2E+00	NA	3E-03	2E+00
			Arsenic	2E-04	NA	8E-08	2E-04	Cardiovascular, Dermal	1E+00	NA	5E-04	1E+00
			Barium	NA	NA	NA	NA	Urinary	4E-02	NA	3E-04	4E-02
			Naphthalene	1E-06	NA	1E-07	1E-06	Whole body	1E-03	NA	1E-04	2E-03
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	5E-02	NA	3E-03	5E-02
			1,1-Dichloroethane	6E-08	NA	8E-10	6E-08	Urinary	1E-04	NA	2E-06	2E-04
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	1E-02	NA	3E-04	1E-02
			Benzene	8E-08	NA	2E-09	8E-08	Immune	1E-03	NA	2E-05	1E-03
			Bromomethane	NA	NA	NA	NA	Gastrointestinal	5E-02	NA	3E-04	5E-02
			Chloroform	2E-06	NA	3E-08	2E-06	Hepatic	2E-02	NA	3E-04	2E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	2E-01	NA	5E-03	2E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole body	1E-02	NA	2E-04	1E-02
			Ethylbenzene	6E-08	NA	6E-09	7E-08	Hepatic, Urinary	2E-04	NA	2E-05	2E-04
			Trichloroethene	8E-06	NA	2E-07	8E-06	Developmental, Cardiovascular, Immune	9E-01	NA	3E-02	9E-01

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
		Exposure Point Total		4E-04	NA	8E-07	4E-04		5E+00	NA	4E-02	5E+00
	Exposure Medium Total			4E-04	NA	8E-07	4E-04		5E+00	NA	4E-02	5E+00
Groundwater Total				4E-04	8E-06	8E-07	4E-04		5E+00	1E+02	4E-02	1E+02
Receptor Total				4E-04	8E-06	8E-07	4E-04		5E+00	1E+02	4E-02	1E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**3**
Total Dermal HI Across Media =	1
Total Developmental HI Across Media =	**2**
Total Hepatic HI Across Media =	0.3
Total Immune HI Across Media =	**3**
Total Nervous HI Across Media =	**2**
Total Respiratory HI Across Media =	0.08
Total Urinary HI Across Media =	0.3
Total Whole body HI Across Media =	**6**
Total Gastrointestinal HI Across Media =	0.05
Total NOE HI Across Media =	**113**

TABLE 9.9.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Shallow Groundwater	Shallow Groundwater	Shallow Groundwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	5E-04	NA	2E-03	2E-03
			2,6-Dinitrotoluene	7E-11	NA	5E-10	6E-10	Spleen	2E-05	NA	2E-04	2E-04
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	2E-04	NA	7E-04	9E-04
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	4E-04	NA	2E-03	2E-03
			HMX	NA	NA	NA	NA	Hepatic	9E-04	NA	2E-04	1E-03
			RDX	3E-09	NA	3E-09	6E-09	Nervous	9E-04	NA	8E-04	2E-03
			Barium	NA	NA	NA	NA	Urinary	3E-04	NA	3E-03	3E-03
			Naphthalene	1E-12	NA	9E-11	1E-10	Whole body	4E-08	NA	3E-06	3E-06
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	9E-05	NA	3E-03	3E-03
			1,1-Dichloroethane	9E-13	NA	7E-12	8E-12	Urinary	2E-07	NA	1E-06	2E-06
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	3E-04	NA	4E-03	5E-03
			Bromomethane	NA	NA	NA	NA	Gastrointestinal	2E-04	NA	5E-04	7E-04
			Chloroform	3E-12	NA	3E-11	3E-11	Hepatic	2E-06	NA	2E-05	2E-05
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	3E-04	NA	4E-03	4E-03
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole body	4E-04	NA	5E-03	6E-03
			Trichloroethene	1E-10	NA	2E-09	2E-09	Developmental, Cardiovascular, Immune	1E-02	NA	2E-01	2E-01
		Exposure Point Total		4E-09	NA	5E-09	9E-09		1E-02	NA	2E-01	2E-01
	Exposure Medium Total			4E-09	NA	5E-09	9E-09		1E-02	NA	2E-01	2E-01
	Trench Air	Vapors in a Trench	Naphthalene	NA	8E-10	NA	8E-10	Nervous, Respiratory	NA	2E-02	NA	2E-02
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	1E-01	NA	1E-01
			1,1-Dichloroethane	NA	6E-10	NA	6E-10	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	3E-02	NA	3E-02
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	2E-02	NA	2E-02
			Chloroform	NA	5E-09	NA	5E-09	Hepatic	NA	2E-03	NA	2E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	3E-02	NA	3E-02
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	2E-02	NA	2E-02
			Trichloroethene	NA	2E-08	NA	2E-08	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00

TABLE 9.9.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
		Exposure Point Total		NA	3E-08	NA	3E-08		NA	6E+00	NA	6E+00
	Exposure Medium Total			NA	3E-08	NA	3E-08		NA	6E+00	NA	6E+00
Groundwater Total				4E-09	3E-08	5E-09	4E-08		1E-02	6E+00	2E-01	6E+00
Receptor Total				4E-09	3E-08	5E-09	4E-08		1E-02	6E+00	2E-01	6E+00

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**6**
Total Developmental HI Across Media =	**6**
Total Hepatic HI Across Media =	0.04
Total Immune HI Across Media =	**6**
Total Nervous HI Across Media =	0.04
Total Respiratory HI Across Media =	0.04
Total Urinary HI Across Media =	0.007
Total Whole body HI Across Media =	0.03
Total Gastrointestinal HI Across Media =	0.0007
Total NOE HI Across Media =	0.1

TABLE 9.10.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane	NA	NA	NA	NA	NOE	NA	5E+02	NA	5E+02
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	3E-01	NA	3E-01
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	3E-01	NA	3E-01
			Chloroform	NA	NA	NA	NA	Hepatic	NA	2E-02	NA	2E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	1E-01	NA	1E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	2E+01	NA	2E+01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	8E-01	NA	3E-02	9E-01
			2,6-Dinitrotoluene	NA	NA	NA	NA	Spleen	1E-01	NA	7E-03	1E-01
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	2E-01	NA	7E-03	2E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	3E-01	NA	1E-02	3E-01
			HMX	NA	NA	NA	NA	Hepatic	3E-01	NA	5E-04	3E-01
			RDX	NA	NA	NA	NA	Nervous	7E+00	NA	6E-02	7E+00
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	4E+00	NA	2E-02	4E+00
			Barium	NA	NA	NA	NA	Urinary	1E-01	NA	1E-02	2E-01
			Naphthalene	NA	NA	NA	NA	Whole body	5E-03	NA	3E-03	8E-03
			1,1,2-Trichlorotrifluoroethane	NA	NA	NA	NA	Nervous	2E-01	NA	6E-02	2E-01
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	5E-04	NA	4E-05	6E-04
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	5E-02	NA	6E-03	5E-02
			Benzene	NA	NA	NA	NA	Immune	4E-03	NA	5E-04	4E-03
			Bromomethane	NA	NA	NA	NA	Gastrointestinal	2E-01	NA	6E-03	2E-01
			Chloroform	NA	NA	NA	NA	Hepatic	6E-02	NA	6E-03	7E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	9E-01	NA	1E-01	1E+00
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole body	3E-02	NA	4E-03	4E-02
			Ethylbenzene	NA	NA	NA	NA	Hepatic, Urinary	6E-04	NA	3E-04	9E-04
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	3E+00	NA	5E-01	4E+00
		Exposure Point Total		NA	NA	NA	NA		2E+01	NA	9E-01	2E+01
	Exposure Medium Total			NA	NA	NA	NA		2E+01	NA	9E-01	2E+01

TABLE 9.10.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	5E-01	NA	5E-01
			1,1,2-Trichlorotrifluoroethane	NA	NA	NA	NA	NOE	NA	2E+01	NA	2E+01
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			Benzene	NA	NA	NA	NA	Immune	NA	8E-03	NA	8E-03
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	8E-01	NA	8E-01
			Chloroform	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	7E-01	NA	7E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	1E+00	NA	1E+00
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	9E-04	NA	9E-04
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	1E+01	NA	1E+01
		Exposure Point Total		NA	NA	NA	NA		NA	3E+01	NA	3E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E+01	NA	3E+01
Groundwater Total				NA	NA	NA	NA		2E+01	5E+02	9E-01	6E+02
Receptor Total				NA	NA	NA	NA		2E+01	5E+02	9E-01	6E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**26**
Total Dermal HI Across Media =	**4**
Total Developmental HI Across Media =	**23**
Total Hepatic HI Across Media =	1
Total Immune HI Across Media =	**24**
Total Nervous HI Across Media =	**9**
Total Respiratory HI Across Media =	**2**
Total Urinary HI Across Media =	1
Total Whole body HI Across Media =	**25**
Total Gastrointestinal HI Across Media =	0.2
Total NOE HI Across Media =	**491**

TABLE 9.11.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (F	NA	NA	NA	NA	NOE	NA	5E+02	NA	5E+02
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	3E-01	NA	3E-01
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	3E-01	NA	3E-01
			Chloroform	NA	NA	NA	NA	Hepatic	NA	2E-02	NA	2E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	1E-01	NA	1E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	2E+01	NA	2E+01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	1E+00	NA	4E-02	1E+00
			2,6-Dinitrotoluene	NA	NA	NA	NA	Spleen	2E-01	NA	1E-02	2E-01
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	3E-01	NA	1E-02	3E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	5E-01	NA	2E-02	6E-01
			HMX	NA	NA	NA	NA	Hepatic	4E-01	NA	7E-04	4E-01
			RDX	NA	NA	NA	NA	Nervous	1E+01	NA	9E-02	1E+01
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	6E+00	NA	3E-02	6E+00
			Barium	NA	NA	NA	NA	Urinary	2E-01	NA	2E-02	3E-01
			Naphthalene	NA	NA	NA	NA	Whole body	8E-03	NA	5E-03	1E-02
			1,1,2-Trichlorotrifluoroethane (F	NA	NA	NA	NA	Nervous	3E-01	NA	9E-02	4E-01
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	9E-04	NA	6E-05	9E-04
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	8E-02	NA	9E-03	9E-02
			Benzene	NA	NA	NA	NA	Immune	6E-03	NA	8E-04	7E-03
			Bromomethane	NA	NA	NA	NA	Gastrointestinal	3E-01	NA	8E-03	3E-01
			Chloroform	NA	NA	NA	NA	Hepatic	1E-01	NA	8E-03	1E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	1E+00	NA	2E-01	2E+00
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole body	6E-02	NA	6E-03	6E-02
			Ethylbenzene	NA	NA	NA	NA	Hepatic, Urinary	9E-04	NA	5E-04	1E-03
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	5E+00	NA	8E-01	6E+00
		Exposure Point Total		NA	NA	NA	NA		3E+01	NA	1E+00	3E+01
	Exposure Medium Total			NA	NA	NA	NA		3E+01	NA	1E+00	3E+01

TABLE 9.11.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	5E-01	NA	5E-01
			1,1,2-Trichlorotrifluoroethane (F	NA	NA	NA	NA	NOE	NA	2E+01	NA	2E+01
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			Benzene	NA	NA	NA	NA	Immune	NA	8E-03	NA	8E-03
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	8E-01	NA	8E-01
			Chloroform	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	7E-01	NA	7E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	1E+00	NA	1E+00
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	9E-04	NA	9E-04
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	1E+01	NA	1E+01
		Exposure Point Total		NA	NA	NA	NA		NA	3E+01	NA	3E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E+01	NA	3E+01
Groundwater Total				NA	NA	NA	NA		3E+01	5E+02	1E+00	6E+02
Receptor Total				NA	NA	NA	NA		3E+01	5E+02	1E+00	6E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**31**
Total Dermal HI Across Media =	**6**
Total Developmental HI Across Media =	**25**
Total Hepatic HI Across Media =	**2**
Total Immune HI Across Media =	**27**
Total Nervous HI Across Media =	**14**
Total Respiratory HI Across Media =	**2**
Total Urinary HI Across Media =	**2**
Total Whole body HI Across Media =	**25**
Total Gastrointestinal HI Across Media =	0.3
Total NOE HI Across Media =	**491**

TABLE 9.12.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Trichloroethene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
		Exposure Point Total		NA	4E-05	NA	4E-05		NA	NA	NA	NA
	Exposure Medium Total			NA	4E-05	NA	4E-05		NA	NA	NA	NA
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			2,6-Dinitrotoluene	2E-05	NA	1E-06	2E-05	NA	NA	NA	NA	NA
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA
			RDX	1E-03	NA	8E-06	1E-03	NA	NA	NA	NA	NA
			Arsenic	7E-04	NA	4E-06	7E-04	NA	NA	NA	NA	NA
			Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Naphthalene	5E-06	NA	3E-06	8E-06	NA	NA	NA	NA	NA
			1,1,2-Trichlorotrifluoroethane (	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethane	3E-07	NA	2E-08	3E-07	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	3E-07	NA	5E-08	4E-07	NA	NA	NA	NA	NA
			Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	8E-06	NA	7E-07	9E-06	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	3E-07	NA	2E-07	4E-07	NA	NA	NA	NA	NA
			Trichloroethene	5E-05	NA	5E-06	5E-05	NA	NA	NA	NA	NA
		Exposure Point Total		2E-03	NA	2E-05	2E-03		NA	NA	NA	NA
	Exposure Medium Total			2E-03	NA	2E-05	2E-03		NA	NA	NA	NA

TABLE 9.12.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			1,1,2-Trichlorotrifluoroethane (	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethane	NA	1E-06	NA	1E-06	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	NA	7E-07	NA	7E-07	NA	NA	NA	NA	NA
			Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	9E-05	NA	9E-05	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	NA	8E-07	NA	8E-07	NA	NA	NA	NA	NA
			Trichloroethene	NA	6E-05	NA	6E-05	NA	NA	NA	NA	NA
		Exposure Point Total		NA	2E-04	NA	2E-04		NA	NA	NA	NA
	Exposure Medium Total			NA	2E-04	NA	2E-04		NA	NA	NA	NA
Groundwater Total				2E-03	2E-04	2E-05	2E-03		NA	NA	NA	NA
Receptor Total				2E-03	2E-04	2E-05	2E-03		NA	NA	NA	NA

Notes: NA = Not applicable or not available

TABLE 10.1.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Current
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	1E+02	NA	1E+02
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	6E+00	NA	6E+00
		Exposure Point Total		NA	NA	NA	NA		NA	1E+02	NA	1E+02
	Exposure Medium Total			NA	NA	NA	NA		NA	1E+02	NA	1E+02
Groundwater Total				NA	NA	NA	NA		NA	1E+02	NA	1E+02
Receptor Total				NA	NA	NA	NA		NA	1E+02	NA	1E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Whole body HI Across Media =	**6**
Total NOE HI Across Media =	**113**

TABLE 10.2.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future

Receptor Population: Site Worker

Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	1E+02	NA	1E+02
			Chloroform	NA	4E-06	NA	4E-06	Hepatic	NA	5E-03	NA	5E-03
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	6E+00	NA	6E+00
			Trichloroethene	NA	4E-06	NA	4E-06	Developmental, Cardiovascular, Immune	NA	1E+00	NA	1E+00
		Exposure Point Total		NA	8E-06	NA	8E-06		NA	1E+02	NA	1E+02
	Exposure Medium Total			NA	8E-06	NA	8E-06		NA	1E+02	NA	1E+02
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	2E-01	NA	1E-03	2E-01
			2,6-Dinitrotoluene	5E-06	NA	6E-08	5E-06	Spleen	3E-02	NA	3E-04	3E-02
			RDX	2E-04	NA	3E-07	2E-04	Nervous	2E+00	NA	3E-03	2E+00
			Arsenic	2E-04	NA	8E-08	2E-04	Cardiovascular, Dermal	1E+00	NA	5E-04	1E+00
			Trichloroethene	8E-06	NA	2E-07	8E-06	Developmental, Cardiovascular, Immune	9E-01	NA	3E-02	9E-01
		Exposure Point Total		4E-04	NA	7E-07	4E-04		5E+00	NA	4E-02	5E+00
	Exposure Medium Total			4E-04	NA	7E-07	4E-04		5E+00	NA	4E-02	5E+00
Groundwater Total				4E-04	8E-06	7E-07	4E-04		5E+00	1E+02	4E-02	1E+02
Receptor Total				4E-04	8E-06	7E-07	4E-04		5E+00	1E+02	4E-02	1E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**3**
Total Developmental HI Across Media =	**2**
Total Immune HI Across Media =	**3**
Total Nervous HI Across Media =	**2**
Total Whole body HI Across Media =	**6**
Total NOE HI Across Media =	**113**

TABLE 10.3.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future

Receptor Population: Construction/Utility Worker

Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Shallow Groundwater	Shallow Groundwater	Shallow Groundwater	Trichloroethene	1E-10	NA	2E-09	2E-09	Developmental, Cardiovascular, Immune	1E-02	NA	2E-01	2E-01
		Exposure Point Total		4E-09	NA	5E-09	9E-09		1E-02	NA	2E-01	2E-01
	Exposure Medium Total			4E-09	NA	5E-09	9E-09		1E-02	NA	2E-01	2E-01
	Trench Air	Vapors in a Trench	Trichloroethene	NA	2E-08	NA	2E-08	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
		Exposure Point Total		NA	3E-08	NA	3E-08		NA	6E+00	NA	6E+00
	Exposure Medium Total			NA	3E-08	NA	3E-08		NA	6E+00	NA	6E+00
Groundwater Total				4E-09	3E-08	5E-09	4E-08		1E-02	6E+00	2E-01	6E+00
Receptor Total				4E-09	3E-08	5E-09	4E-08		1E-02	6E+00	2E-01	6E+00

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**6**
Total Developmental HI Across Media =	**6**
Total Immune HI Across Media =	**6**

TABLE 10.4.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+02	NA	5E+02
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	3E-01	NA	3E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	2E+01	NA	2E+01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	8E-01	NA	3E-02	9E-01
			RDX	NA	NA	NA	NA	Nervous	7E+00	NA	6E-02	7E+00
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	4E+00	NA	2E-02	4E+00
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	2E-01	NA	6E-02	2E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	3E+00	NA	5E-01	4E+00
		Exposure Point Total		NA	NA	NA	NA		2E+01	NA	9E-01	2E+01
	Exposure Medium Total			NA	NA	NA	NA		2E+01	NA	9E-01	2E+01
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	5E-01	NA	5E-01
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E+01	NA	2E+01
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	8E-01	NA	8E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	1E+00	NA	1E+00
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	1E+01	NA	1E+01
		Exposure Point Total		NA	NA	NA	NA		NA	3E+01	NA	3E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E+01	NA	3E+01
Groundwater Total				NA	NA	NA	NA		2E+01	5E+02	9E-01	6E+02
Receptor Total				NA	NA	NA	NA		2E+01	5E+02	9E-01	6E+02

TABLE 10.4.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**26**
Total Dermal HI Across Media =	**4**
Total Developmental HI Across Media =	**23**
Total Immune HI Across Media =	**24**
Total Nervous HI Across Media =	**9**
Total Respiratory HI Across Media =	**2**
Total Whole body HI Across Media =	**25**
Total NOE HI Across Media =	**491**

TABLE 10.5.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future

Receptor Population: Resident

Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+02	NA	5E+02
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	3E-01	NA	3E-01
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	3E-01	NA	3E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	2E+01	NA	2E+01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+02	NA	5E+02
	Tapwater	Tapwater	1,3-Dinitrobenzene	NA	NA	NA	NA	Immune	1E+00	NA	4E-02	1E+00
			2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	3E-01	NA	1E-02	3E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	5E-01	NA	2E-02	6E-01
			HMX	NA	NA	NA	NA	Hepatic	4E-01	NA	7E-04	4E-01
			RDX	NA	NA	NA	NA	Nervous	1E+01	NA	9E-02	1E+01
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	6E+00	NA	3E-02	6E+00
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	3E-01	NA	9E-02	4E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	5E+00	NA	8E-01	6E+00
		Exposure Point Total		NA	NA	NA	NA		3E+01	NA	1E+00	3E+01
	Exposure Medium Total			NA	NA	NA	NA		3E+01	NA	1E+00	3E+01

TABLE 10.5.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
West Burn Pad Area
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	5E-01	NA	5E-01
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E+01	NA	2E+01
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			Bromomethane	NA	NA	NA	NA	Nervous, Respiratory	NA	8E-01	NA	8E-01
			Dichlorodifluoromethane	NA	NA	NA	NA	Whole Body	NA	1E+00	NA	1E+00
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	1E+01	NA	1E+01
		Exposure Point Total		NA	NA	NA	NA		NA	3E+01	NA	3E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	3E+01	NA	3E+01
Groundwater Total				NA	NA	NA	NA		3E+01	5E+02	1E+00	6E+02
Receptor Total				NA	NA	NA	NA		3E+01	5E+02	1E+00	6E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**31**
Total Dermal HI Across Media =	**6**
Total Developmental HI Across Media =	**25**
Total Hepatic HI Across Media =	**2**
Total Immune HI Across Media =	**27**
Total Nervous HI Across Media =	**14**
Total Respiratory HI Across Media =	**2**
Total Whole body HI Across Media =	**25**
Total NOE HI Across Media =	**491**

TABLE 10.6.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

West Burn Pad Area

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air	Indoor Air	Chloroform	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Trichloroethene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
		Exposure Point Total		NA	4E-05	NA	4E-05		NA	NA	NA	NA
	Exposure Medium Total			NA	4E-05	NA	4E-05		NA	NA	NA	NA
	Tapwater	Tapwater	2,6-Dinitrotoluene	2E-05	NA	1E-06	2E-05	NA	NA	NA	NA	NA
			RDX	1E-03	NA	8E-06	1E-03	NA	NA	NA	NA	NA
			Arsenic	7E-04	NA	4E-06	7E-04	NA	NA	NA	NA	NA
			Naphthalene	5E-06	NA	3E-06	8E-06	NA	NA	NA	NA	NA
			Trichloroethene	5E-05	NA	5E-06	5E-05	NA	NA	NA	NA	NA
		Exposure Point Total		2E-03	NA	2E-05	2E-03		NA	NA	NA	NA
	Exposure Medium Total			2E-03	NA	2E-05	2E-03		NA	NA	NA	NA
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Naphthalene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			1,1-Dichloroethane	NA	1E-06	NA	1E-06	NA	NA	NA	NA	NA
			Trichloroethene	NA	6E-05	NA	6E-05	NA	NA	NA	NA	NA
		Exposure Point Total		NA	8E-05	NA	8E-05		NA	NA	NA	NA
	Exposure Medium Total			NA	8E-05	NA	8E-05		NA	NA	NA	NA
Groundwater Total				2E-03	1E-04	2E-05	2E-03		NA	NA	NA	NA
Receptor Total				2E-03	1E-04	2E-05	2E-03		NA	NA	NA	NA

Notes: NA = Not applicable or not available

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	4-Nitrotoluene	0.42	U	µg/L	0.42	1
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	HMX	1.1	=	µg/L	0.21	0.42
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	RDX	2	=	µg/L	0.42	0.42
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_WBP	G-30	G-30-0319	WG	3/8/2019	7	17	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,1,1-Trichloroethane	0.18	J	µg/L	0.16	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.19	U	µg/L	0.4	3
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	p-Chlorotoluene	0.8	U	µg/L	0.8	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	G-30	G-30-R0319	WG	3/23/2019	7	17	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	J	µg/L	0.059	0.2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	DNX	0.76	J	µg/L	0.26	0.51
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	HMX	450	=	µg/L	20	41
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	MNX	2.4	=	µg/L	0.3	0.51
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	RDX	35	J	µg/L	16	41
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Arsenic	8	U	µg/L	8	10
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Barium	260	=	µg/L	1.8	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chromium	8	U	µg/L	8	10
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Lead	2	U	µg/L	2	3
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Selenium	4	U	µg/L	4	5
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Silver	1.8	U	µg/L	1.8	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	6.1	J	µg/L	0.4	3
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromomethane	0.8	UJ	µg/L	0.8	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	0.33	J	µg/L	0.31	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichloroethene	0.17	J	µg/L	0.16	1
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	DNX	0.18	J	µg/L	0.097	0.5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	HMX	5.2	=	µg/L	0.2	0.4
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	MNX	0.31	J	µg/L	0.092	0.5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	RDX	1.2	=	µg/L	0.4	0.4
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Arsenic	8	U	µg/L	8	10
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Barium	160	=	µg/L	1.8	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chromium	8	U	µg/L	8	10
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Lead	2	U	µg/L	2	3
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Selenium	4	U	µg/L	4	5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Silver	1.8	U	µg/L	1.8	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	1200	=	µg/L	4	30
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.36	J	µg/L	0.22	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	3.9	=	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	1.3	=	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	23	=	µg/L	0.8	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Trichloroethene	0.64	J	µg/L	0.16	1
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Amino-2,6-dinitrotoluene	0.11	J	µg/L	0.058	0.2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	HMX	370	=	µg/L	10	20
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	MNX	0.74	J	µg/L	0.29	0.5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	RDX	15	=	µg/L	0.4	0.4
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloroform	0.16	J	µg/L	0.16	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3,5-Trinitrobenzene	0.39	UJ	µg/L	0.39	0.97
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3-Dinitrobenzene	0.19	UJ	µg/L	0.19	0.39
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2,4,6-Trinitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2,4-Dinitrotoluene	0.19	UJ	µg/L	0.19	0.39
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2,6-Dinitrotoluene	0.19	UJ	µg/L	0.19	0.19
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2-Nitrotoluene	0.19	UJ	µg/L	0.19	0.39
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	4-Amino-2,6-dinitrotoluene	0.058	J	μg/L	0.058	0.2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	4-Nitrotoluene	0.39	UJ	μg/L	0.39	0.97
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	DNX	0.38	J	μg/L	0.098	0.5
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	HMX	8.1	=	μg/L	0.2	0.4
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	MNX	0.24	J	μg/L	0.094	0.5
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Nitrobenzene	0.19	UJ	μg/L	0.19	0.39
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	RDX	4.8	=	μg/L	0.4	0.4
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Tetryl	0.19	UJ	μg/L	0.19	0.23
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	TNX	0.24	UJ	μg/L	0.24	0.49
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Naphthalene	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2,4-Trichlorobenzene	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dichlorobenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3-Dichlorobenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,4-Dichlorobenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Hexachlorobutadiene	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,1,2-Tetrachloroethane	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,1-Trichloroethane	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,2,2-Tetrachloroethane	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,2-Trichloroethane	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	μg/L	0.4	3
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1-Dichloroethane	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1-Dichloroethene	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1-Dichloropropene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2,3-Trichlorobenzene	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2,3-Trichloropropane	0.8	U	μg/L	0.8	3
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2,4-Trimethylbenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dibromo-3-chloropropane	1.6	U	μg/L	1.6	5
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dibromoethane	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dichloroethane	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dichloropropane	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3,5-Trimethylbenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3-Dichloropropane	0.2	U	μg/L	0.2	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1-Chlorohexane	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2,2-Dichloropropane	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2-Chlorotoluene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2-Hexanone	4	U	μg/L	4	5
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	4-Isopropyltoluene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Acetone	6.4	U	μg/L	6.4	10
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Benzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromobenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromochloromethane	0.2	U	μg/L	0.2	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromodichloromethane	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromoform	1	U	μg/L	1	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromomethane	0.8	UJ	μg/L	0.8	2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Carbon disulfide	0.8	U	μg/L	0.8	2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Carbon tetrachloride	0.4	U	μg/L	0.4	2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Chloro methane	0.8	U	μg/L	0.8	2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Chlorobenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Chloroethane	1.6	U	μg/L	1.6	2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Chloroform	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	cis-1,2-Dichloroethene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	cis-1,3-Dichloropropene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Dibromochloromethane	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Dibromomethane	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Dichlorodifluoromethane	0.8	U	μg/L	0.8	2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Ethyl- benzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Isopropylbenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Methyl ethyl ketone	4	U	μg/L	4	6
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Methyl isobutyl ketone	3.2	U	μg/L	3.2	5
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Methyl tert-butyl ether (MTBE)	0.8	U	μg/L	0.8	5
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Methylene chloride	2	U	μg/L	2	5
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	N-Butylbenzene	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	N-Propylbenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	p-Chlorotoluene	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	sec-Butylbenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Styrene	0.8	U	μg/L	0.8	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	tert-Butylbenzene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Tetrachloroethene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Toluene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	trans-1,2-Dichloroethene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	trans-1,3-Dichloropropene	0.4	U	μg/L	0.4	1
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Trichloroethene	0.4	U	μg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	4-Nitrotoluene	0.42	U	µg/L	0.42	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	HMX	0.86	J	µg/L	0.21	0.42
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	MNX	0.24	J	µg/L	0.097	0.52
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	RDX	4.1	=	µg/L	0.42	0.42
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	J	µg/L	0.18	3
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dichloroethane	0.2	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Chloroform	0.28	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3,5-Trinitrobenzene	0.22	J	µg/L	0.2	0.98
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2-Amino-4,6-dinitrotoluene	0.074	J	µg/L	0.05	0.2
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2-Nitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	4-Amino-2,6-dinitrotoluene	0.23	J	µg/L	0.12	0.2
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	DNX	0.25	U	µg/L	0.25	0.49
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	HMX	12	=	µg/L	0.2	0.39
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	MNX	1.3	=	µg/L	0.28	0.49
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	RDX	37	=	µg/L	3.9	3.9
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	TNX	0.16	J	µg/L	0.078	0.49
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Naphthalene	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2,4-Trichlorobenzene	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,4-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Hexachlorobutadiene	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,1,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,1-Trichloroethane	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,2,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,2-Trichloroethane	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,2-Trichlorotrifluoroethane (Freon 113)	20000	=	µg/L	40	300
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1-Dichloroethane	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1-Dichloroethene	79	J	µg/L	23	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1-Dichloropropene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2,3-Trichlorobenzene	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2,3-Trichloropropane	80	U	µg/L	80	300
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2,4-Trimethylbenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dibromo-3-chloropropane	160	U	µg/L	160	500
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dibromoethane	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dichloroethane	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dichloropropane	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3,5-Trimethylbenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3-Dichloropropane	20	U	µg/L	20	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1-Chlorohexane	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2,2-Dichloropropane	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2-Chlorotoluene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2-Hexanone	400	U	µg/L	400	500
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	4-Isopropyltoluene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Acetone	470	J	µg/L	190	1000
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Benzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromobenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromochloromethane	20	U	µg/L	20	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromodichloromethane	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromoform	100	U	µg/L	100	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromomethane	80	U	µg/L	80	200
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Carbon disulfide	80	U	µg/L	80	200
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Carbon tetrachloride	40	U	µg/L	40	200
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Chloro methane	80	U	µg/L	80	200
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Chlorobenzene	40	U	µg/L	40	100

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Chloroethane	160	U	µg/L	160	200
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Chloroform	21	J	µg/L	16	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	cis-1,2-Dichloroethene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	cis-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Dibromochloromethane	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Dibromomethane	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Dichlorodifluoromethane	80	U	µg/L	80	200
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Ethyl- benzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Isopropylbenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Methyl ethyl ketone	400	U	µg/L	400	600
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Methyl isobutyl ketone	320	U	µg/L	320	500
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Methyl tert-butyl ether (MTBE)	80	U	µg/L	80	500
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Methylene chloride	200	U	µg/L	200	500
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	N-Butylbenzene	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	N-Propylbenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	p-Chlorotoluene	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	sec-Butylbenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Styrene	80	U	µg/L	80	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	tert-Butylbenzene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Tetrachloroethene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Toluene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	trans-1,2-Dichloroethene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	trans-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Trichloroethene	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Trichlorofluoromethane (Freon 11)	80	U	µg/L	80	200
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Vinyl chloride	20	U	µg/L	20	150
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Xylene, m,p-	80	U	µg/L	80	200
AOC_GW_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Xylene, o-	40	U	µg/L	40	100
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	DNX	0.26	U	µg/L	0.26	0.51
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	HMX	13	J	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	RDX	13	=	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_GW_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Naphthalene	3.2	J	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	37000	J	µg/L	160	1200
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1-Dichloroethane	0.58	J	µg/L	0.22	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2,4-Trimethylbenzene	2.7	J	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,3,5-Trimethylbenzene	0.64	J	µg/L	0.16	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	2-Hexanone	4	UJ	µg/L	4	5

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	4-Isopropyltoluene	0.58	J	µg/L	0.2	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Benzene	0.17	J	µg/L	0.16	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	cis-1,2-Dichloroethene	0.87	J	µg/L	0.15	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Ethyl- benzene	0.7	J	µg/L	0.16	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Isopropylbenzene	0.22	J	µg/L	0.19	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Methyl ethyl ketone	8.1	J	µg/L	4	6
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	N-Butylbenzene	0.67	J	µg/L	0.14	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	N-Propylbenzene	0.28	J	µg/L	0.16	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	sec-Butylbenzene	0.52	J	µg/L	0.17	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Toluene	6	J	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Trichloroethene	0.77	J	µg/L	0.16	1
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Xylene, m,p-	2.1	J	µg/L	0.8	2
AOC_GW_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Xylene, o-	1.7	J	µg/L	0.4	1
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	HMX	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Arsenic	37	=	µg/L	8	10
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Barium	960	J	µg/L	1.8	2
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Lead	2	U	µg/L	2	3
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_GW_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3,5-Trinitrobenzene	0.41	UJ	µg/L	0.41	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,4,6-Trinitrotoluene	0.41	UJ	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,6-Dinitrotoluene	0.34	J	µg/L	0.2	0.2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.41

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	3-Nitrotoluene	0.41	UJ	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Nitrotoluene	0.41	UJ	µg/L	0.41	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	DNX	0.3	J	µg/L	0.099	0.51
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	HMX	0.2	UJ	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	MNX	0.29	UJ	µg/L	0.29	0.51
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Nitrobenzene	0.2	UJ	µg/L	0.2	0.41
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	RDX	0.41	UJ	µg/L	0.41	0.41
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	TNX	1.6	J	µg/L	0.25	0.51
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Naphthalene	1.6	J	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	J	µg/L	800	6000
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,4-Trimethylbenzene	3.9	J	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3,5-Trimethylbenzene	1.3	J	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Isopropyltoluene	0.7	J	µg/L	0.2	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Benzene	0.47	J	µg/L	0.16	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromomethane	1.3	J	µg/L	0.21	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Carbon disulfide	68	J	µg/L	0.8	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Ethyl- benzene	1.9	J	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Isopropylbenzene	0.36	J	µg/L	0.19	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	N-Butylbenzene	0.93	J	µg/L	0.14	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	N-Propylbenzene	0.61	J	µg/L	0.16	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	sec-Butylbenzene	0.69	J	µg/L	0.17	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Toluene	8.1	J	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Trichloroethene	0.26	J	µg/L	0.16	1
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Xylene, m,p-	2.9	J	µg/L	0.8	2
AOC_GW_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Xylene, o-	2.8	J	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trinitrobenzene	0.39	UJ	µg/L	0.39	0.98
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4,6-Trinitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,6-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Amino-2,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.98
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	DNX	0.25	UJ	µg/L	0.25	0.49
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	HMX	0.2	UJ	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	MNX	0.28	UJ	µg/L	0.28	0.49
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Nitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	RDX	0.39	UJ	µg/L	0.39	0.39
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	TNX	0.25	U	µg/L	0.25	0.49
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Arsenic	8	U	µg/L	8	10
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Barium	15	=	µg/L	1.8	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chromium	8	U	µg/L	8	10
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Lead	2	U	µg/L	2	3
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Selenium	4	U	µg/L	4	5
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Silver	1.8	U	µg/L	1.8	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.1	U	µg/L	0.4	3
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	HMX	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Arsenic	8	U	µg/L	8	10
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Barium	18	=	µg/L	1.8	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chromium	8	U	µg/L	8	10
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Lead	1.1	J	µg/L	1	3
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Selenium	4	U	µg/L	4	5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Silver	1.8	U	µg/L	1.8	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.84	J	µg/L	0.18	3
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	DNX	0.25	U	µg/L	0.25	0.49
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	HMX	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	MNX	0.28	U	µg/L	0.28	0.49
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	RDX	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	TNX	0.25	U	µg/L	0.25	0.49
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	300	J	µg/L	2	15
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Carbon disulfide	0.21	J	µg/L	0.17	2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3,5-Trinitrobenzene	0.21	U	µg/L	0.21	0.22
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dinitrobenzene	0.1	U	µg/L	0.1	0.11
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,4,6-Trinitrotoluene	0.1	U	µg/L	0.1	0.11
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,4-Dinitrotoluene	0.082	U	µg/L	0.082	0.1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,6-Dinitrotoluene	0.082	U	µg/L	0.082	0.1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Amino-4,6-dinitrotoluene	0.1	U	µg/L	0.1	0.11
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Nitrotoluene	0.21	U	µg/L	0.21	0.22
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.15
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Nitrotoluene	0.41	U	µg/L	0.41	0.42
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	HMX	0.21	U	µg/L	0.21	0.22
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Nitrobenzene	0.21	U	µg/L	0.21	0.22
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	RDX	0.21	U	µg/L	0.21	0.22

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Tetryl	0.1	U	µg/L	0.1	0.11
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	DNX	0.24	U	µg/L	0.24	0.49
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	HMX	55	=	µg/L	2	3.9
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	MNX	0.2	J	µg/L	0.091	0.49
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	RDX	3.2	=	µg/L	0.39	0.39
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	TNX	0.24	U	µg/L	0.24	0.49
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,2-Trichlorotrifluoroethane (Freon 113)	8800	J	µg/L	40	300
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	tert-Butylbenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	HMX	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Arsenic	8	U	µg/L	8	10
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Barium	130	=	µg/L	1.8	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chromium	8	U	µg/L	8	10
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Lead	1.2	J	µg/L	1	3
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Selenium	4	U	µg/L	4	5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Silver	1.8	U	µg/L	1.8	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Naphthalene	1.3	J	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2-Trichlorotrifluoroethane (Freon 113)	30000	J	µg/L	160	1200
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,4-Trimethylbenzene	1.9	J	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3,5-Trimethylbenzene	0.58	J	µg/L	0.16	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1-Chlorohexane	0.31	J	µg/L	0.19	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Isopropyltoluene	0.56	J	µg/L	0.2	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloro methane	0.8	UJ	µg/L	0.8	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloroform	2.1	J	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Ethyl- benzene	0.43	J	µg/L	0.16	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	N-Butylbenzene	0.8	J	µg/L	0.14	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	N-Propylbenzene	0.23	J	µg/L	0.16	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	sec-Butylbenzene	0.49	J	µg/L	0.17	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Toluene	1.2	J	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Xylene, m,p-	1.1	J	µg/L	0.15	2
AOC_GW_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Xylene, o-	0.62	J	µg/L	0.19	1
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	HMX	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Naphthalene	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trichlorobenzene	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichlorobenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichlorobenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,4-Dichlorobenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Hexachlorobutadiene	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1-Trichloroethane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichloroethane	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichlorotrifluoroethane (Freon 113)	4600	=	µg/L	40	300
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethane	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethene	29	=	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloropropene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichlorobenzene	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichloropropane	16	U	µg/L	16	60
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trimethylbenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromo-3-chloropropane	32	U	µg/L	32	100
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromoethane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloroethane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloropropane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trimethylbenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichloropropane	4	U	µg/L	4	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1-Chlorohexane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,2-Dichloropropane	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Chlorotoluene	8	U	µg/L	8	20

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Hexanone	80	U	µg/L	80	100
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Isopropyltoluene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Acetone	130	U	µg/L	130	200
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Benzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromobenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromochloromethane	4	U	µg/L	4	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromodichloromethane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromoform	20	U	µg/L	20	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromomethane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon disulfide	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon tetrachloride	8	U	µg/L	8	40
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloro methane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chlorobenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroethane	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroform	6.7	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromochloromethane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromomethane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dichlorodifluoromethane	230	=	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Ethyl- benzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Isopropylbenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl ethyl ketone	80	U	µg/L	80	120
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl isobutyl ketone	64	U	µg/L	64	100
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl tert-butyl ether (MTBE)	16	U	µg/L	16	100
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methylene chloride	40	U	µg/L	40	100
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Butylbenzene	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Propylbenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	p-Chlorotoluene	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	sec-Butylbenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Styrene	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	tert-Butylbenzene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetrachloroethene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Toluene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichloroethene	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichlorofluoromethane (Freon 11)	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Vinyl chloride	4	U	µg/L	4	30
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, m,p-	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, o-	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Amino-4,6-dinitrotoluene	0.51	J	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Amino-2,6-dinitrotoluene	1.1	J	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	DNX	4.7	J	µg/L	0.26	0.51
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	HMX	170	=	µg/L	2	4.1
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	MNX	1.7	=	µg/L	0.3	0.51
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	RDX	51	=	µg/L	4.1	4.1
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Naphthalene	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	5900	=	µg/L	40	300
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethane	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethene	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloropropene	16	U	µg/L	16	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trimethylbenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloroethane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trimethylbenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1-Chlorohexane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Chlorotoluene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Hexanone	160	U	µg/L	160	200
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Acetone	260	U	µg/L	260	400
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Benzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromobenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromochloromethane	8	U	µg/L	8	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromodichloromethane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromoform	40	U	µg/L	40	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromomethane	32	U	µg/L	32	80
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon disulfide	32	U	µg/L	32	80
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon tetrachloride	16	U	µg/L	16	80
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloro methane	32	U	µg/L	32	80
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chlorobenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroethane	64	U	µg/L	64	80
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroform	12	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromochloromethane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromomethane	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dichlorodifluoromethane	79	J	µg/L	12	80
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Ethyl- benzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Isopropylbenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl ethyl ketone	160	U	µg/L	160	240
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl isobutyl ketone	130	U	µg/L	130	200
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methylene chloride	80	U	µg/L	80	200
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Butylbenzene	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Propylbenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	p-Chlorotoluene	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	sec-Butylbenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Styrene	32	U	µg/L	32	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	tert-Butylbenzene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetrachloroethene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Toluene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichloroethene	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Vinyl chloride	8	U	µg/L	8	60
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, m,p-	32	U	µg/L	32	80
AOC_GW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, o-	16	U	µg/L	16	40
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Amino-2,6-dinitrotoluene	0.26	J	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	DNX	0.43	J	µg/L	0.097	0.5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	HMX	54	=	µg/L	2	4
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	MNX	0.98	=	µg/L	0.29	0.5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	RDX	12	=	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Arsenic	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Barium	640	=	µg/L	1.8	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Cadmium	0.63	=	µg/L	0.4	0.5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chromium	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Lead	2	U	µg/L	2	3
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Selenium	4	U	µg/L	4	5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Silver	1.8	U	µg/L	1.8	2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Naphthalene	0.27	J	µg/L	0.22	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	=	µg/L	16	120
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethane	0.37	J	µg/L	0.22	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethene	11	=	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trimethylbenzene	0.29	J	µg/L	0.15	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Acetone	92	=	µg/L	6.4	10
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,2-Dichloroethene	0.49	J	µg/L	0.15	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dichlorodifluoromethane	140	=	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Toluene	0.41	J	µg/L	0.17	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichloroethene	0.77	J	µg/L	0.16	1
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, m,p-	0.24	J	µg/L	0.15	2

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, o-	0.25	J	µg/L	0.19	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1.1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	4-Nitrotoluene	0.42	U	µg/L	0.42	1.1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	DNX	0.26	U	µg/L	0.26	0.53
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	HMX	0.55	J	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	MNX	0.3	U	µg/L	0.3	0.53
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	RDX	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	TNX	0.26	U	µg/L	0.26	0.53
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,2-Trichlorotrifluoroethane (Freon 113)	210	=	µg/L	2	15
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1-Dichloroethene	0.8	J	µg/L	0.23	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2,4-Trimethylbenzene	0.15	J	µg/L	0.15	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Acetone	7.8	J	µg/L	1.9	10
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Benzene	0.21	J	µg/L	0.16	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	cis-1,2-Dichloroethene	0.35	J	µg/L	0.15	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Dichlorodifluoromethane	67	=	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	N-Propylbenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Toluene	3.1	=	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Trichloroethene	0.2	J	µg/L	0.16	1
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	HMX	2.6	=	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.63	U	µg/L	0.4	3
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Amino-4,6-dinitrotoluene	0.068	J	µg/L	0.051	0.2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	DNX	0.33	J	µg/L	0.098	0.5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	HMX	29	=	µg/L	2	4
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	MNX	4	=	µg/L	0.29	0.5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	RDX	120	=	µg/L	4	4
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	TNX	3.1	=	µg/L	0.25	0.5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Arsenic	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Barium	91	=	µg/L	1.8	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chromium	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Lead	2	U	µg/L	2	3
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Selenium	2.8	J	µg/L	2	5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Silver	1.8	U	µg/L	1.8	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,1-Trichloroethane	0.43	J	µg/L	0.16	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2-Trichlorotrifluoroethane (Freon 113)	12000	J	µg/L	40	300
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloroethane	1	J	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloroethene	47	J	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Acetone	380	J	µg/L	6.4	10
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromomethane	3.8	J	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloro methane	2.9	J	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloroform	0.33	J	µg/L	0.16	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	cis-1,2-Dichloroethene	9.6	J	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dichlorodifluoromethane	69	J	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Trichloroethene	13	J	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	DNX	0.25	U	µg/L	0.25	0.51
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	HMX	11	=	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	MNX	0.29	U	µg/L	0.29	0.51
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	RDX	0.51	=	µg/L	0.41	0.41
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	TNX	0.25	U	µg/L	0.25	0.51
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	52	=	µg/L	0.4	3
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	0.24	J	µg/L	0.23	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2-Hexanone	4	U	µg/L	4	5
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromoform	1	U	µg/L	1	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	10	=	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Methylene chloride	2	U	µg/L	2	5
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	HMX	7.2	=	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	RDX	0.4	U	µg/L	0.4	0.4

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,2-Trichlorotrifluoroethane (Freon 113)	540	J	µg/L	4	30
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.99
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dinitrobenzene	2.8	J	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,6-Dinitrotoluene	1	J	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Nitrotoluene	0.39	U	µg/L	0.39	0.99
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	DNX	36	J	µg/L	0.096	0.49
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	HMX	91	=	µg/L	20	40
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	MNX	33	J	µg/L	0.091	0.49
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	RDX	940	=	µg/L	39	39
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetryl	1.7	J	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	TNX	23	J	µg/L	0.25	0.49
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1-Trichloroethane	0.65	J	µg/L	0.16	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichlorotrifluoroethane (Freon 113)	28000	J	µg/L	80	600
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethane	3.5	J	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Benzene	0.19	J	µg/L	0.16	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromoform	1	UJ	µg/L	1	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromomethane	8.4	J	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloro methane	6.2	J	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroform	0.51	J	µg/L	0.16	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,2-Dichloroethene	57	J	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,2-Dichloroethene	0.5	J	µg/L	0.15	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichloroethene	54	J	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2-Amino-4,6-dinitrotoluene	0.43	J	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2-Nitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	4-Amino-2,6-dinitrotoluene	0.41	J	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	DNX	0.39	J	µg/L	0.096	0.49
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	HMX	58	=	µg/L	3.9	7.9
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	MNX	2.7	=	µg/L	0.28	0.49
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	RDX	87	=	µg/L	7.9	7.9
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	TNX	13	=	µg/L	0.25	0.49
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2-Nitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	DNX	0.25	U	µg/L	0.25	0.49
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	HMX	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	MNX	0.29	U	µg/L	0.29	0.49
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	RDX	0.39	U	µg/L	0.39	0.39
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	TNX	0.25	U	µg/L	0.25	0.49
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Amino-4,6-dinitrotoluene	0.42	J	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Amino-2,6-dinitrotoluene	0.6	=	µg/L	0.12	0.2
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	DNX	0.33	J	µg/L	0.097	0.5
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	HMX	52	=	µg/L	4	8
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	MNX	3.7	=	µg/L	0.29	0.5
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	RDX	140	=	µg/L	8	8
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Naphthalene	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,1-Trichloroethane	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2-Trichlorotrifluoroethane (Freon 113)	710	=	µg/L	4	30
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloroethane	8	U	µg/L	8	10

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloroethene	4.2	J	µg/L	2.3	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,4-Trimethylbenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichloroethane	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3,5-Trimethylbenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1-Chlorohexane	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Chlorotoluene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Hexanone	40	U	µg/L	40	50
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Isopropyltoluene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Acetone	19	J	µg/L	19	100
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Benzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromobenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromochloromethane	2	U	µg/L	2	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromodichloromethane	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromoform	10	U	µg/L	10	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromomethane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Carbon disulfide	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Carbon tetrachloride	4	U	µg/L	4	20
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloro methane	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chlorobenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloroethane	16	U	µg/L	16	20
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloroform	2.2	J	µg/L	1.6	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	cis-1,2-Dichloroethene	2.1	J	µg/L	1.5	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dibromochloromethane	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dibromomethane	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dichlorodifluoromethane	3.6	J	µg/L	3.1	20
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Ethyl- benzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Isopropylbenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl ethyl ketone	40	U	µg/L	40	60
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl isobutyl ketone	32	U	µg/L	32	50
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methylene chloride	20	U	µg/L	20	50
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	N-Butylbenzene	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	N-Propylbenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	p-Chlorotoluene	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	sec-Butylbenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Styrene	8	U	µg/L	8	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	tert-Butylbenzene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Tetrachloroethene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Toluene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Trichloroethene	2.1	J	µg/L	1.6	10
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Vinyl chloride	2	U	µg/L	2	15
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Xylene, m,p-	8	U	µg/L	8	20
AOC_GW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Xylene, o-	4	U	µg/L	4	10
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2-Amino-4,6-dinitrotoluene	0.54	=	µg/L	0.13	0.21
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	4-Amino-2,6-dinitrotoluene	0.51	J	µg/L	0.13	0.21
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	4-Nitrotoluene	0.42	U	µg/L	0.42	1
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	DNX	0.14	J	µg/L	0.1	0.52
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	HMX	56	=	µg/L	2.1	4.2
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	MNX	1.1	=	µg/L	0.3	0.52
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	RDX	40	=	µg/L	4.2	4.2
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	Tetryl	0.16	J	µg/L	0.083	0.25
AOC_GW_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	TNX	0.26	U	µg/L	0.26	0.52

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	J	µg/L	0.059	0.2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	DNX	0.76	J	µg/L	0.26	0.51
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	HMX	450	=	µg/L	20	41
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	MNX	2.4	=	µg/L	0.3	0.51
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	RDX	35	J	µg/L	16	41
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Barium	260	=	µg/L	1.8	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chromium	8	U	µg/L	8	10
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Lead	2	U	µg/L	2	3
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Selenium	4	U	µg/L	4	5
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	6.1	J	µg/L	0.4	3
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	0.33	J	µg/L	0.31	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichloroethene	0.17	J	µg/L	0.16	1
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	DNX	0.18	J	µg/L	0.097	0.5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	HMX	5.2	=	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	MNX	0.31	J	µg/L	0.092	0.5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	RDX	1.2	=	µg/L	0.4	0.4
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Barium	160	=	µg/L	1.8	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chromium	8	U	µg/L	8	10
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Lead	2	U	µg/L	2	3
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Selenium	4	U	µg/L	4	5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	1200	=	µg/L	4	30
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.36	J	µg/L	0.22	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	3.9	=	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	2-Hexanone	4	U	µg/L	4	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	1.3	=	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	23	=	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Trichloroethene	0.64	J	µg/L	0.16	1
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-24	JAW-24-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Amino-2,6-dinitrotoluene	0.11	J	µg/L	0.058	0.2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	HMX	370	=	µg/L	10	20
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	MNX	0.74	J	µg/L	0.29	0.5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	RDX	15	=	µg/L	0.4	0.4
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloroform	0.16	J	µg/L	0.16	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trinitrobenzene	0.39	UJ	µg/L	0.39	0.98
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4,6-Trinitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,6-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Amino-2,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.98
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	DNX	0.25	UJ	µg/L	0.25	0.49
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	HMX	0.2	UJ	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	MNX	0.28	UJ	µg/L	0.28	0.49
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Nitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	RDX	0.39	UJ	µg/L	0.39	0.39
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	TNX	0.25	U	µg/L	0.25	0.49
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Barium	15	=	µg/L	1.8	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Cadmium	0.4	U	µg/L	0.4	0.5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chromium	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Lead	2	U	µg/L	2	3
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Selenium	4	U	µg/L	4	5
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.1	U	µg/L	0.4	3
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, o-	0.4	U	µg/L	0.4	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	HMX	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Barium	18	=	µg/L	1.8	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chromium	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Lead	1.1	J	µg/L	1	3
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Selenium	4	U	µg/L	4	5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.84	J	µg/L	0.18	3
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Ethyl- benzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-MW2	WBP-MW2-0319	WG	3/22/2019	30.5	40.5	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	HMX	0.21	U	µg/L	0.21	0.41
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Naphthalene	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trichlorobenzene	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichlorobenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichlorobenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,4-Dichlorobenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Hexachlorobutadiene	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1-Trichloroethane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichloroethane	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichlorotrifluoroethane (Freon 113)	4600	=	µg/L	40	300
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethane	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethene	29	=	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloropropene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichlorobenzene	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichloropropane	16	U	µg/L	16	60
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trimethylbenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromo-3-chloropropane	32	U	µg/L	32	100
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromoethane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloroethane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloropropane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trimethylbenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichloropropane	4	U	µg/L	4	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1-Chlorohexane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,2-Dichloropropane	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Chlorotoluene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Hexanone	80	U	µg/L	80	100
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Isopropyltoluene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Acetone	130	U	µg/L	130	200
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Benzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromobenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromochloromethane	4	U	µg/L	4	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromodichloromethane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromoform	20	U	µg/L	20	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromomethane	16	U	µg/L	16	40

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon disulfide	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon tetrachloride	8	U	µg/L	8	40
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloro methane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chlorobenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroethane	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroform	6.7	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromochloromethane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromomethane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dichlorodifluoromethane	230	=	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Ethyl- benzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Isopropylbenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl ethyl ketone	80	U	µg/L	80	120
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl isobutyl ketone	64	U	µg/L	64	100
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl tert-butyl ether (MTBE)	16	U	µg/L	16	100
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methylene chloride	40	U	µg/L	40	100
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Butylbenzene	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Propylbenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	p-Chlorotoluene	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	sec-Butylbenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Styrene	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	tert-Butylbenzene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetrachloroethene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Toluene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichloroethene	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichlorofluoromethane (Freon 11)	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Vinyl chloride	4	U	µg/L	4	30
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, m,p-	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, o-	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Amino-4,6-dinitrotoluene	0.51	J	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Amino-2,6-dinitrotoluene	1.1	J	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	DNX	4.7	J	µg/L	0.26	0.51
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	HMX	170	=	µg/L	2	4.1
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	MNX	1.7	=	µg/L	0.3	0.51
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	RDX	51	=	µg/L	4.1	4.1
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Naphthalene	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	5900	=	µg/L	40	300
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethane	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethene	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trimethylbenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloroethane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trimethylbenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichloropropane	8	U	µg/L	8	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1-Chlorohexane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Chlorotoluene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Hexanone	160	U	µg/L	160	200
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Acetone	260	U	µg/L	260	400
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Benzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromobenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromochloromethane	8	U	µg/L	8	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromodichloromethane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromoform	40	U	µg/L	40	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromomethane	32	U	µg/L	32	80
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon disulfide	32	U	µg/L	32	80
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon tetrachloride	16	U	µg/L	16	80
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloro methane	32	U	µg/L	32	80
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chlorobenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroethane	64	U	µg/L	64	80
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroform	12	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromochloromethane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromomethane	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dichlorodifluoromethane	79	J	µg/L	12	80
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Ethyl- benzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Isopropylbenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl ethyl ketone	160	U	µg/L	160	240
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl isobutyl ketone	130	U	µg/L	130	200
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methylene chloride	80	U	µg/L	80	200
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Butylbenzene	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Propylbenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	p-Chlorotoluene	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	sec-Butylbenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Styrene	32	U	µg/L	32	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	tert-Butylbenzene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetrachloroethene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Toluene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichloroethene	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Vinyl chloride	8	U	µg/L	8	60
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, m,p-	32	U	µg/L	32	80
AOC_GW-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, o-	16	U	µg/L	16	40
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Amino-2,6-dinitrotoluene	0.26	J	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	DNX	0.43	J	µg/L	0.097	0.5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	HMX	54	=	µg/L	2	4
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	MNX	0.98	=	µg/L	0.29	0.5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	RDX	12	=	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Barium	640	=	µg/L	1.8	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Cadmium	0.63	=	µg/L	0.4	0.5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chromium	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Lead	2	U	µg/L	2	3
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Selenium	4	U	µg/L	4	5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Naphthalene	0.27	J	µg/L	0.22	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	=	µg/L	16	120
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethane	0.37	J	µg/L	0.22	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethene	11	=	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trimethylbenzene	0.29	J	µg/L	0.15	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Acetone	92	=	µg/L	6.4	10
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,2-Dichloroethene	0.49	J	µg/L	0.15	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dichlorodifluoromethane	140	=	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Toluene	0.41	J	µg/L	0.17	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichloroethene	0.77	J	µg/L	0.16	1
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, m,p-	0.24	J	µg/L	0.15	2
AOC_GW-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, o-	0.25	J	µg/L	0.19	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1.1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	4-Nitrotoluene	0.42	U	µg/L	0.42	1.1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	DNX	0.26	U	µg/L	0.26	0.53
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	HMX	0.55	J	µg/L	0.21	0.42
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	MNX	0.3	U	µg/L	0.3	0.53
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	RDX	0.42	U	µg/L	0.42	0.42
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	TNX	0.26	U	µg/L	0.26	0.53
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1,2-Trichlorotrifluoroethane (Freon 113)	210	=	µg/L	2	15
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1-Dichloroethene	0.8	J	µg/L	0.23	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2,4-Trimethylbenzene	0.15	J	µg/L	0.15	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Acetone	7.8	J	µg/L	1.9	10
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Benzene	0.21	J	µg/L	0.16	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	cis-1,2-Dichloroethene	0.35	J	µg/L	0.15	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Dichlorodifluoromethane	67	=	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Toluene	3.1	=	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Trichloroethene	0.2	J	µg/L	0.16	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-04	WBP-TTMW-04-0319	WG	3/22/2019	6	11	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	HMX	2.6	=	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.63	U	µg/L	0.4	3
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	DNX	0.25	U	µg/L	0.25	0.51
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	HMX	11	=	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	MNX	0.29	U	µg/L	0.29	0.51
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	RDX	0.51	=	µg/L	0.41	0.41
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	TNX	0.25	U	µg/L	0.25	0.51
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	52	=	µg/L	0.4	3
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	0.24	J	µg/L	0.23	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	10	=	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-08	WBP-TTMW-08-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	HMX	7.2	=	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1,2-Trichlorotrifluoroethane (Freon 113)	540	J	µg/L	4	30
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	2-Hexanone	4	UJ	µg/L	4	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-10	WBP-TTMW-10-0319	WG	3/23/2019	7.2	12.2	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.99
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dinitrobenzene	2.8	J	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,6-Dinitrotoluene	1	J	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Nitrotoluene	0.39	U	µg/L	0.39	0.99
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	DNX	36	J	µg/L	0.096	0.49
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	HMX	91	=	µg/L	20	40
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	MNX	33	J	µg/L	0.091	0.49
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	RDX	940	=	µg/L	39	39
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetryl	1.7	J	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	TNX	23	J	µg/L	0.25	0.49
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1-Trichloroethane	0.65	J	µg/L	0.16	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichlorotrifluoroethane (Freon 113)	28000	J	µg/L	80	600
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethane	3.5	J	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Benzene	0.19	J	µg/L	0.16	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromomethane	8.4	J	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloro methane	6.2	J	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroform	0.51	J	µg/L	0.16	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,2-Dichloroethene	57	J	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,2-Dichloroethene	0.5	J	µg/L	0.15	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichloroethene	54	J	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	2-Nitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	DNX	0.25	U	µg/L	0.25	0.49
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	HMX	0.2	U	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	MNX	0.29	U	µg/L	0.29	0.49
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	RDX	0.39	U	µg/L	0.39	0.39
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-TTMW-13	WBP-TTMW-13-0319	WG	3/19/2019	4.2	14.2	TNX	0.25	U	µg/L	0.25	0.49
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Amino-4,6-dinitrotoluene	0.42	J	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Amino-2,6-dinitrotoluene	0.6	=	µg/L	0.12	0.2
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	DNX	0.33	J	µg/L	0.097	0.5
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	HMX	52	=	µg/L	4	8
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	MNX	3.7	=	µg/L	0.29	0.5
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	RDX	140	=	µg/L	8	8
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Naphthalene	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,1-Trichloroethane	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2-Trichlorotrifluoroethane (Freon 113)	710	=	µg/L	4	30
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloroethane	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloroethene	4.2	J	µg/L	2.3	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,4-Trimethylbenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichloroethane	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3,5-Trimethylbenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1-Chlorohexane	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Chlorotoluene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Hexanone	40	U	µg/L	40	50
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Isopropyltoluene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Acetone	19	J	µg/L	19	100
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Benzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromobenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromochloromethane	2	U	µg/L	2	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromodichloromethane	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromoform	10	U	µg/L	10	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromomethane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Carbon disulfide	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Carbon tetrachloride	4	U	µg/L	4	20
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloro methane	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chlorobenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloroethane	16	U	µg/L	16	20
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloroform	2.2	J	µg/L	1.6	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	cis-1,2-Dichloroethene	2.1	J	µg/L	1.5	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dibromochloromethane	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dibromomethane	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dichlorodifluoromethane	3.6	J	µg/L	3.1	20
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Ethyl- benzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Isopropylbenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl ethyl ketone	40	U	µg/L	40	60
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl isobutyl ketone	32	U	µg/L	32	50
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methylene chloride	20	U	µg/L	20	50
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	N-Butylbenzene	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	N-Propylbenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	p-Chlorotoluene	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	sec-Butylbenzene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Styrene	8	U	µg/L	8	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	tert-Butylbenzene	4	U	µg/L	4	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Tetrachloroethene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Toluene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Trichloroethene	2.1	J	µg/L	1.6	10
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Vinyl chloride	2	U	µg/L	2	15
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Xylene, m,p-	8	U	µg/L	8	20
AOC_GW-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Xylene, o-	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	J	µg/L	0.059	0.2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	DNX	0.76	J	µg/L	0.26	0.51
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	HMX	450	=	µg/L	20	41
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	MNX	2.4	=	µg/L	0.3	0.51
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	RDX	35	J	µg/L	16	41
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	TNX	0.26	U	µg/L	0.26	0.51
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Arsenic	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Barium	260	=	µg/L	1.8	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Lead	2	U	µg/L	2	3
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Selenium	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	6.1	J	µg/L	0.4	3
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloro methane	0.8	UJ	µg/L	0.8	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	0.33	J	µg/L	0.31	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Toluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichloroethene	0.17	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Amino-2,6-dinitrotoluene	0.11	J	µg/L	0.058	0.2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	DNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	HMX	370	=	µg/L	10	20
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	MNX	0.74	J	µg/L	0.29	0.5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	RDX	15	=	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Chlorotoluene	0.4	U	µg/L	0.4	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromoform	1	U	µg/L	1	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromomethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloroform	0.16	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3,5-Trinitrobenzene	0.39	UJ	µg/L	0.39	0.97
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3-Dinitrobenzene	0.19	UJ	µg/L	0.19	0.39
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2,4,6-Trinitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2,4-Dinitrotoluene	0.19	UJ	µg/L	0.19	0.39
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2,6-Dinitrotoluene	0.19	UJ	µg/L	0.19	0.19
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2-Nitrotoluene	0.19	UJ	µg/L	0.19	0.39
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	4-Amino-2,6-dinitrotoluene	0.058	J	µg/L	0.058	0.2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.97
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	DNX	0.38	J	µg/L	0.098	0.5
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	HMX	8.1	=	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	MNX	0.24	J	µg/L	0.094	0.5
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Nitrobenzene	0.19	UJ	µg/L	0.19	0.39
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	RDX	4.8	=	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Tetryl	0.19	UJ	µg/L	0.19	0.23
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	TNX	0.24	UJ	µg/L	0.24	0.49
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,1-Dichloropropene	0.4	U	µg/L	0.4	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromoform	1	U	µg/L	1	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	JAW-68	JAW-68-1219	WG	12/19/2019	8	18	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	4-Nitrotoluene	0.42	U	µg/L	0.42	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	DNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	HMX	0.86	J	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	MNX	0.24	J	µg/L	0.097	0.52
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	RDX	4.1	=	µg/L	0.42	0.42
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	TNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	J	µg/L	0.18	3
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dichloroethane	0.2	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Chloroform	0.28	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-1	WBP-99-1-0319	WG	3/9/2019	25	35	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3,5-Trinitrobenzene	0.22	J	µg/L	0.2	0.98
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2-Amino-4,6-dinitrotoluene	0.074	J	µg/L	0.05	0.2
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2-Nitrotoluene	0.2	U	µg/L	0.2	0.39

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	4-Amino-2,6-dinitrotoluene	0.23	J	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	DNX	0.25	U	µg/L	0.25	0.49
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	HMX	12	=	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	MNX	1.3	=	µg/L	0.28	0.49
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	RDX	37	=	µg/L	3.9	3.9
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	TNX	0.16	J	µg/L	0.078	0.49
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Naphthalene	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2,4-Trichlorobenzene	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dichlorobenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3-Dichlorobenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,4-Dichlorobenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Hexachlorobutadiene	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,1,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,1-Trichloroethane	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,2,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,2-Trichloroethane	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1,2-Trichlorotrifluoroethane (Freon 113)	20000	=	µg/L	40	300
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1-Dichloroethane	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1-Dichloroethene	79	J	µg/L	23	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,1-Dichloropropene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2,3-Trichlorobenzene	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2,3-Trichloropropane	80	U	µg/L	80	300
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2,4-Trimethylbenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dibromo-3-chloropropane	160	U	µg/L	160	500
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dibromoethane	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dichloroethane	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,2-Dichloropropane	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3,5-Trimethylbenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1,3-Dichloropropane	20	U	µg/L	20	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	1-Chlorohexane	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2,2-Dichloropropane	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2-Chlorotoluene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	2-Hexanone	400	U	µg/L	400	500
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	4-Isopropyltoluene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Acetone	470	J	µg/L	190	1000
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Benzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromobenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromochloromethane	20	U	µg/L	20	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromodichloromethane	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromoform	100	U	µg/L	100	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Bromomethane	80	U	µg/L	80	200
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Carbon disulfide	80	U	µg/L	80	200
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Carbon tetrachloride	40	U	µg/L	40	200
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Chloro methane	80	U	µg/L	80	200
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Chlorobenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Chloroethane	160	U	µg/L	160	200
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Chloroform	21	J	µg/L	16	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	cis-1,2-Dichloroethene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	cis-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Dibromochloromethane	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Dibromomethane	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Dichlorodifluoromethane	80	U	µg/L	80	200
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Ethyl- benzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Isopropylbenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Methyl ethyl ketone	400	U	µg/L	400	600
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Methyl isobutyl ketone	320	U	µg/L	320	500
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Methyl tert-butyl ether (MTBE)	80	U	µg/L	80	500
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Methylene chloride	200	U	µg/L	200	500
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	N-Butylbenzene	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	N-Propylbenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	p-Chlorotoluene	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	sec-Butylbenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Styrene	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	tert-Butylbenzene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Tetrachloroethene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Toluene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	trans-1,2-Dichloroethene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	trans-1,3-Dichloropropene	40	U	µg/L	40	100

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Trichloroethene	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Trichlorofluoromethane (Freon 11)	80	U	µg/L	80	200
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Vinyl chloride	20	U	µg/L	20	150
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Xylene, m,p-	80	U	µg/L	80	200
AOC_RDX-Plume_WBP	WBP-99-2	WBP-99-2-0319	WG	3/19/2019	15	25	Xylene, o-	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	DNX	0.26	U	µg/L	0.26	0.51
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	HMX	13	J	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	MNX	0.3	U	µg/L	0.3	0.51
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	RDX	13	=	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_RDX-Plume_WBP	WBP-99-4	WBP-99-4-0319	WG	3/22/2019	19	24	TNX	0.26	U	µg/L	0.26	0.51
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Naphthalene	3.2	J	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	37000	J	µg/L	160	1200
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1-Dichloroethane	0.58	J	µg/L	0.22	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2,4-Trimethylbenzene	2.7	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,3,5-Trimethylbenzene	0.64	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	4-Isopropyltoluene	0.58	J	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Benzene	0.17	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	cis-1,2-Dichloroethene	0.87	J	µg/L	0.15	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Ethyl- benzene	0.7	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Isopropylbenzene	0.22	J	µg/L	0.19	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Methyl ethyl ketone	8.1	J	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	N-Butylbenzene	0.67	J	µg/L	0.14	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	N-Propylbenzene	0.28	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	sec-Butylbenzene	0.52	J	µg/L	0.17	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Toluene	6	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Trichloroethene	0.77	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Xylene, m,p-	2.1	J	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-5	WBP-99-5-R0319	WG	3/23/2019	10	20	Xylene, o-	1.7	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	DNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	HMX	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	MNX	0.3	U	µg/L	0.3	0.52
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	RDX	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	TNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Arsenic	37	=	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Barium	960	J	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Lead	2	U	µg/L	2	3
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3,5-Trinitrobenzene	0.41	UJ	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,4,6-Trinitrotoluene	0.41	UJ	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,6-Dinitrotoluene	0.34	J	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	3-Nitrotoluene	0.41	UJ	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Nitrotoluene	0.41	UJ	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	DNX	0.3	J	µg/L	0.099	0.51
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	HMX	0.2	UJ	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	MNX	0.29	UJ	µg/L	0.29	0.51
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Nitrobenzene	0.2	UJ	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	RDX	0.41	UJ	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	TNX	1.6	J	µg/L	0.25	0.51
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Naphthalene	1.6	J	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	J	µg/L	800	6000
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,4-Trimethylbenzene	3.9	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3,5-Trimethylbenzene	1.3	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Isopropyltoluene	0.7	J	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Benzene	0.47	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromomethane	1.3	J	µg/L	0.21	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Carbon disulfide	68	J	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Ethyl- benzene	1.9	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Isopropylbenzene	0.36	J	µg/L	0.19	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	N-Butylbenzene	0.93	J	µg/L	0.14	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	N-Propylbenzene	0.61	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	sec-Butylbenzene	0.69	J	µg/L	0.17	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Toluene	8.1	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Trichloroethene	0.26	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Xylene, m,p-	2.9	J	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Xylene, o-	2.8	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trinitrobenzene	0.39	UJ	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4,6-Trinitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,6-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Amino-2,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	DNX	0.25	UJ	µg/L	0.25	0.49
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	HMX	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	MNX	0.28	UJ	µg/L	0.28	0.49
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Nitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	RDX	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	TNX	0.25	U	µg/L	0.25	0.49
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Arsenic	8	U	µg/L	8	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Barium	15	=	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Lead	2	U	µg/L	2	3
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Selenium	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.1	U	µg/L	0.4	3
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromoform	1	U	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	DNX	0.25	U	µg/L	0.25	0.49
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	HMX	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	MNX	0.28	U	µg/L	0.28	0.49
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	RDX	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	TNX	0.25	U	µg/L	0.25	0.49
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	300	J	µg/L	2	15
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Carbon disulfide	0.21	J	µg/L	0.17	2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	N-Butylbenzene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Toluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW3	WBP-MW3-0319	WG	3/23/2019	40.4	50.4	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3,5-Trinitrobenzene	0.21	U	µg/L	0.21	0.22
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dinitrobenzene	0.1	U	µg/L	0.1	0.11
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,4,6-Trinitrotoluene	0.1	U	µg/L	0.1	0.11
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,4-Dinitrotoluene	0.082	U	µg/L	0.082	0.1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,6-Dinitrotoluene	0.082	U	µg/L	0.082	0.1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Amino-4,6-dinitrotoluene	0.1	U	µg/L	0.1	0.11
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Nitrotoluene	0.21	U	µg/L	0.21	0.22
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.15
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Nitrotoluene	0.41	U	µg/L	0.41	0.42
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	DNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	HMX	0.21	U	µg/L	0.21	0.22
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	MNX	0.3	U	µg/L	0.3	0.52
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Nitrobenzene	0.21	U	µg/L	0.21	0.22
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	RDX	0.21	U	µg/L	0.21	0.22
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Tetryl	0.1	U	µg/L	0.1	0.11
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	TNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromoform	1	U	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromomethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloroform	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	DNX	0.24	U	µg/L	0.24	0.49
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	HMX	55	=	µg/L	2	3.9
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	MNX	0.2	J	µg/L	0.091	0.49
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	RDX	3.2	=	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	TNX	0.24	U	µg/L	0.24	0.49
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1,2-Trichlorotrifluoroethane (Freon 113)	8800	J	µg/L	40	300
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Acetone	6.4	U	µg/L	6.4	10

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromoform	1	U	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Bromomethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW8	WBP-MW8-0319	WG	3/23/2019	32	42	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	DNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	HMX	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	MNX	0.29	U	µg/L	0.29	0.5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	RDX	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Arsenic	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Barium	130	=	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Lead	1.2	J	µg/L	1	3
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Selenium	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Naphthalene	1.3	J	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2-Trichlorotrifluoroethane (Freon 113)	30000	J	µg/L	160	1200
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,4-Trimethylbenzene	1.9	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3,5-Trimethylbenzene	0.58	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1-Chlorohexane	0.31	J	µg/L	0.19	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Isopropyltoluene	0.56	J	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloroform	2.1	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Ethyl- benzene	0.43	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	N-Butylbenzene	0.8	J	µg/L	0.14	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	N-Propylbenzene	0.23	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	sec-Butylbenzene	0.49	J	µg/L	0.17	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Toluene	1.2	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Xylene, m,p-	1.1	J	µg/L	0.15	2
AOC_RDX-Plume_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Xylene, o-	0.62	J	µg/L	0.19	1
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	DNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	HMX	0.21	U	µg/L	0.21	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	MNX	0.3	U	µg/L	0.3	0.52
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Nitrobenzene	0.21	U	µg/L	0.21	0.41

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	RDX	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	TNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Naphthalene	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trichlorobenzene	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichlorobenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichlorobenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,4-Dichlorobenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Hexachlorobutadiene	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1-Trichloroethane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichloroethane	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichlorotrifluoroethane (Freon 113)	4600	=	µg/L	40	300
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethane	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethene	29	=	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloropropene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichlorobenzene	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichloropropane	16	U	µg/L	16	60
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trimethylbenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromo-3-chloropropane	32	U	µg/L	32	100
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromoethane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloroethane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloropropane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trimethylbenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichloropropane	4	U	µg/L	4	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1-Chlorohexane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,2-Dichloropropane	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Chlorotoluene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Hexanone	80	U	µg/L	80	100
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Isopropyltoluene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Acetone	130	U	µg/L	130	200
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Benzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromobenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromochloromethane	4	U	µg/L	4	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromodichloromethane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromoform	20	U	µg/L	20	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromomethane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon disulfide	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon tetrachloride	8	U	µg/L	8	40
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloro methane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chlorobenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroethane	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroform	6.7	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromochloromethane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromomethane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dichlorodifluoromethane	230	=	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Ethyl- benzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Isopropylbenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl ethyl ketone	80	U	µg/L	80	120
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl isobutyl ketone	64	U	µg/L	64	100
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl tert-butyl ether (MTBE)	16	U	µg/L	16	100
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methylene chloride	40	U	µg/L	40	100
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Butylbenzene	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Propylbenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	p-Chlorotoluene	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	sec-Butylbenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Styrene	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	tert-Butylbenzene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetrachloroethene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Toluene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichloroethene	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichlorofluoromethane (Freon 11)	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Vinyl chloride	4	U	µg/L	4	30
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, m,p-	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, o-	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Amino-4,6-dinitrotoluene	0.51	J	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Amino-2,6-dinitrotoluene	1.1	J	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	DNX	4.7	J	µg/L	0.26	0.51
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	HMX	170	=	µg/L	2	4.1
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	MNX	1.7	=	µg/L	0.3	0.51
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	RDX	51	=	µg/L	4.1	4.1
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	TNX	0.26	U	µg/L	0.26	0.51
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Naphthalene	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	5900	=	µg/L	40	300
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethane	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethene	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trimethylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloroethane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trimethylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1-Chlorohexane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Chlorotoluene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Hexanone	160	U	µg/L	160	200
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Acetone	260	U	µg/L	260	400
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Benzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromochloromethane	8	U	µg/L	8	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromodichloromethane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromoform	40	U	µg/L	40	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromomethane	32	U	µg/L	32	80
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon disulfide	32	U	µg/L	32	80
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon tetrachloride	16	U	µg/L	16	80
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloro methane	32	U	µg/L	32	80
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chlorobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroethane	64	U	µg/L	64	80
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroform	12	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromochloromethane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromomethane	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dichlorodifluoromethane	79	J	µg/L	12	80
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Ethyl- benzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Isopropylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl ethyl ketone	160	U	µg/L	160	240
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl isobutyl ketone	130	U	µg/L	130	200
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methylene chloride	80	U	µg/L	80	200
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Butylbenzene	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Propylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	p-Chlorotoluene	32	U	µg/L	32	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	sec-Butylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Styrene	32	U	µg/L	32	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	tert-Butylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetrachloroethene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Toluene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichloroethene	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Vinyl chloride	8	U	µg/L	8	60
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, m,p-	32	U	µg/L	32	80
AOC_RDX-Plume_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, o-	16	U	µg/L	16	40
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Amino-2,6-dinitrotoluene	0.26	J	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	DNX	0.43	J	µg/L	0.097	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	HMX	54	=	µg/L	2	4
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	MNX	0.98	=	µg/L	0.29	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	RDX	12	=	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Arsenic	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Barium	640	=	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Cadmium	0.63	=	µg/L	0.4	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Lead	2	U	µg/L	2	3
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Selenium	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Naphthalene	0.27	J	µg/L	0.22	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	=	µg/L	16	120
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethane	0.37	J	µg/L	0.22	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethene	11	=	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trimethylbenzene	0.29	J	µg/L	0.15	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Acetone	92	=	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromoform	1	U	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,2-Dichloroethene	0.49	J	µg/L	0.15	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dichlorodifluoromethane	140	=	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Toluene	0.41	J	µg/L	0.17	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichloroethene	0.77	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, m,p-	0.24	J	µg/L	0.15	2
AOC_RDX-Plume_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, o-	0.25	J	µg/L	0.19	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	DNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	HMX	2.6	=	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	MNX	0.29	U	µg/L	0.29	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	RDX	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.63	U	µg/L	0.4	3
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,2-Dichloropropane	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromoform	1	U	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Amino-4,6-dinitrotoluene	0.068	J	µg/L	0.051	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	DNX	0.33	J	µg/L	0.098	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	HMX	29	=	µg/L	2	4
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	MNX	4	=	µg/L	0.29	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	RDX	120	=	µg/L	4	4
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	TNX	3.1	=	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Arsenic	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Barium	91	=	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Lead	2	U	µg/L	2	3
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Selenium	2.8	J	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,1-Trichloroethane	0.43	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2-Trichlorotrifluoroethane (Freon 113)	12000	J	µg/L	40	300
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloroethane	1	J	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloroethene	47	J	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Acetone	380	J	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromomethane	3.8	J	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloro methane	2.9	J	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloroform	0.33	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	cis-1,2-Dichloroethene	9.6	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dichlorodifluoromethane	69	J	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Toluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Trichloroethene	13	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.99
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dinitrobenzene	2.8	J	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,6-Dinitrotoluene	1	J	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Nitrotoluene	0.39	U	µg/L	0.39	0.99

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	DNX	36	J	µg/L	0.096	0.49
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	HMX	91	=	µg/L	20	40
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	MNX	33	J	µg/L	0.091	0.49
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	RDX	940	=	µg/L	39	39
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetryl	1.7	J	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	TNX	23	J	µg/L	0.25	0.49
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1-Trichloroethane	0.65	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichlorotrifluoroethane (Freon 113)	28000	J	µg/L	80	600
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethane	3.5	J	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Benzene	0.19	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromomethane	8.4	J	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloro methane	6.2	J	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroform	0.51	J	µg/L	0.16	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,2-Dichloroethene	57	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Toluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,2-Dichloroethene	0.5	J	µg/L	0.15	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichloroethene	54	J	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2-Amino-4,6-dinitrotoluene	0.43	J	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	2-Nitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	4-Amino-2,6-dinitrotoluene	0.41	J	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	DNX	0.39	J	µg/L	0.096	0.49
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	HMX	58	=	µg/L	3.9	7.9
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	MNX	2.7	=	µg/L	0.28	0.49
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	RDX	87	=	µg/L	7.9	7.9
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-TTMW-12	WBP-TTMW-12-0319	WG	3/19/2019	7.8	17.8	TNX	13	=	µg/L	0.25	0.49
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Amino-4,6-dinitrotoluene	0.42	J	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Amino-2,6-dinitrotoluene	0.6	=	µg/L	0.12	0.2
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	DNX	0.33	J	µg/L	0.097	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	HMX	52	=	µg/L	4	8
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	MNX	3.7	=	µg/L	0.29	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	RDX	140	=	µg/L	8	8
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Naphthalene	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,1-Trichloroethane	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2-Trichlorotrifluoroethane (Freon 113)	710	=	µg/L	4	30
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloroethane	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloroethene	4.2	J	µg/L	2.3	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,4-Trimethylbenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichloroethane	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3,5-Trimethylbenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1-Chlorohexane	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Chlorotoluene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Hexanone	40	U	µg/L	40	50
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Isopropyltoluene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Acetone	19	J	µg/L	19	100
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Benzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromochloromethane	2	U	µg/L	2	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromodichloromethane	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromoform	10	U	µg/L	10	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromomethane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Carbon disulfide	8	U	µg/L	8	20

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Carbon tetrachloride	4	U	µg/L	4	20
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloro methane	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chlorobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloroethane	16	U	µg/L	16	20
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloroform	2.2	J	µg/L	1.6	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	cis-1,2-Dichloroethene	2.1	J	µg/L	1.5	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dibromochloromethane	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dibromomethane	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dichlorodifluoromethane	3.6	J	µg/L	3.1	20
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Ethyl- benzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Isopropylbenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl ethyl ketone	40	U	µg/L	40	60
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl isobutyl ketone	32	U	µg/L	32	50
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methylene chloride	20	U	µg/L	20	50
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	N-Butylbenzene	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	N-Propylbenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	p-Chlorotoluene	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	sec-Butylbenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Styrene	8	U	µg/L	8	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	tert-Butylbenzene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Tetrachloroethene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Toluene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Trichloroethene	2.1	J	µg/L	1.6	10
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Vinyl chloride	2	U	µg/L	2	15
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Xylene, m,p-	8	U	µg/L	8	20
AOC_RDX-Plume_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Xylene, o-	4	U	µg/L	4	10
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2-Amino-4,6-dinitrotoluene	0.54	=	µg/L	0.13	0.21
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	4-Amino-2,6-dinitrotoluene	0.51	J	µg/L	0.13	0.21
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	4-Nitrotoluene	0.42	U	µg/L	0.42	1
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	DNX	0.14	J	µg/L	0.1	0.52
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	HMX	56	=	µg/L	2.1	4.2
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	MNX	1.1	=	µg/L	0.3	0.52
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	RDX	40	=	µg/L	4.2	4.2
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	Tetryl	0.16	J	µg/L	0.083	0.25
AOC_RDX-Plume_WBP	WBP-TTMW-15	WBP-TTMW-15-0319	WG	3/9/2019	12.8	22.8	TNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	J	µg/L	0.059	0.2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	DNX	0.76	J	µg/L	0.26	0.51
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	HMX	450	=	µg/L	20	41
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	MNX	2.4	=	µg/L	0.3	0.51
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	RDX	35	J	µg/L	16	41
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	TNX	0.26	U	µg/L	0.26	0.51
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Arsenic	8	U	µg/L	8	10
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Barium	260	=	µg/L	1.8	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chromium	8	U	µg/L	8	10
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Lead	2	U	µg/L	2	3
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Selenium	4	U	µg/L	4	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	6.1	J	µg/L	0.4	3
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	0.33	J	µg/L	0.31	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Toluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichloroethene	0.17	J	µg/L	0.16	1
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Amino-2,6-dinitrotoluene	0.11	J	µg/L	0.058	0.2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	DNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	HMX	370	=	µg/L	10	20
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	MNX	0.74	J	µg/L	0.29	0.5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	RDX	15	=	µg/L	0.4	0.4
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromoform	1	U	µg/L	1	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Bromomethane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Chloroform	0.16	J	µg/L	0.16	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Tetrachloroethene	0.4	U	µg/L	0.4	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	JAW-25	JAW-25-0319	WG	3/19/2019	9	19	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trinitrobenzene	0.39	UJ	µg/L	0.39	0.98
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4,6-Trinitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,6-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Amino-2,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.98
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	DNX	0.25	UJ	µg/L	0.25	0.49
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	HMX	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	MNX	0.28	UJ	µg/L	0.28	0.49
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Nitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	RDX	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	TNX	0.25	U	µg/L	0.25	0.49
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Arsenic	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Barium	15	=	µg/L	1.8	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chromium	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Lead	2	U	µg/L	2	3
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Selenium	4	U	µg/L	4	5
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.1	U	µg/L	0.4	3
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromoform	1	U	µg/L	1	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chlorobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	DNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	HMX	0.21	U	µg/L	0.21	0.41
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	MNX	0.3	U	µg/L	0.3	0.52
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	RDX	0.41	U	µg/L	0.41	0.41
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	TNX	0.26	U	µg/L	0.26	0.52
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Naphthalene	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trichlorobenzene	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichlorobenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichlorobenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,4-Dichlorobenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Hexachlorobutadiene	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1-Trichloroethane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichloroethane	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichlorotrifluoroethane (Freon 113)	4600	=	µg/L	40	300
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethane	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethene	29	=	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloropropene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichlorobenzene	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichloropropane	16	U	µg/L	16	60
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trimethylbenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromo-3-chloropropane	32	U	µg/L	32	100
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromoethane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloroethane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloropropane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trimethylbenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichloropropane	4	U	µg/L	4	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1-Chlorohexane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,2-Dichloropropane	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Chlorotoluene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Hexanone	80	U	µg/L	80	100

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Isopropyltoluene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Acetone	130	U	µg/L	130	200
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Benzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromobenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromochloromethane	4	U	µg/L	4	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromodichloromethane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromoform	20	U	µg/L	20	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromomethane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon disulfide	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon tetrachloride	8	U	µg/L	8	40
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloro methane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chlorobenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroethane	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroform	6.7	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromochloromethane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromomethane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dichlorodifluoromethane	230	=	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Ethyl- benzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Isopropylbenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl ethyl ketone	80	U	µg/L	80	120
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl isobutyl ketone	64	U	µg/L	64	100
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl tert-butyl ether (MTBE)	16	U	µg/L	16	100
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methylene chloride	40	U	µg/L	40	100
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Butylbenzene	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Propylbenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	p-Chlorotoluene	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	sec-Butylbenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Styrene	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	tert-Butylbenzene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetrachloroethene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Toluene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichloroethene	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichlorofluoromethane (Freon 11)	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Vinyl chloride	4	U	µg/L	4	30
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, m,p-	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, o-	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Amino-4,6-dinitrotoluene	0.51	J	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Amino-2,6-dinitrotoluene	1.1	J	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	DNX	4.7	J	µg/L	0.26	0.51
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	HMX	170	=	µg/L	2	4.1
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	MNX	1.7	=	µg/L	0.3	0.51
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	RDX	51	=	µg/L	4.1	4.1
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	TNX	0.26	U	µg/L	0.26	0.51
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Naphthalene	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	5900	=	µg/L	40	300
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethane	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethene	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichlorobenzene	32	U	µg/L	32	40

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trimethylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloroethane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trimethylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1-Chlorohexane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Chlorotoluene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Hexanone	160	U	µg/L	160	200
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Acetone	260	U	µg/L	260	400
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Benzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromobenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromochloromethane	8	U	µg/L	8	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromodichloromethane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromoform	40	U	µg/L	40	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromomethane	32	U	µg/L	32	80
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon disulfide	32	U	µg/L	32	80
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon tetrachloride	16	U	µg/L	16	80
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloro methane	32	U	µg/L	32	80
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chlorobenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroethane	64	U	µg/L	64	80
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroform	12	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromochloromethane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromomethane	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dichlorodifluoromethane	79	J	µg/L	12	80
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Ethyl- benzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Isopropylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl ethyl ketone	160	U	µg/L	160	240
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl isobutyl ketone	130	U	µg/L	130	200
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methylene chloride	80	U	µg/L	80	200
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Butylbenzene	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Propylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	p-Chlorotoluene	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	sec-Butylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Styrene	32	U	µg/L	32	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	tert-Butylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetrachloroethene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Toluene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichloroethene	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Vinyl chloride	8	U	µg/L	8	60
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, m,p-	32	U	µg/L	32	80
AOC_RDX-CW_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, o-	16	U	µg/L	16	40
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Amino-2,6-dinitrotoluene	0.26	J	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	DNX	0.43	J	µg/L	0.097	0.5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	HMX	54	=	µg/L	2	4
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	MNX	0.98	=	µg/L	0.29	0.5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	RDX	12	=	µg/L	0.4	0.4
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Arsenic	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Barium	640	=	µg/L	1.8	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Cadmium	0.63	=	µg/L	0.4	0.5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chromium	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Lead	2	U	µg/L	2	3
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Selenium	4	U	µg/L	4	5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Naphthalene	0.27	J	µg/L	0.22	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	=	µg/L	16	120
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethane	0.37	J	µg/L	0.22	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethene	11	=	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trimethylbenzene	0.29	J	µg/L	0.15	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Acetone	92	=	µg/L	6.4	10
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromoform	1	U	µg/L	1	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,2-Dichloroethene	0.49	J	µg/L	0.15	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dichlorodifluoromethane	140	=	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Toluene	0.41	J	µg/L	0.17	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichloroethene	0.77	J	µg/L	0.16	1
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, m,p-	0.24	J	µg/L	0.15	2
AOC_RDX-CW_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, o-	0.25	J	µg/L	0.19	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	DNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	HMX	2.6	=	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	MNX	0.29	U	µg/L	0.29	0.5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	RDX	0.4	U	µg/L	0.4	0.4
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Naphthalene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.63	U	µg/L	0.4	3
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Benzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromoform	1	U	µg/L	1	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroethane	1.6	U	µg/L	1.6	2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methylene chloride	2	U	µg/L	2	5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	p-Chlorotoluene	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Toluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.99
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dinitrobenzene	2.8	J	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,6-Dinitrotoluene	1	J	µg/L	0.2	0.2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Nitrotoluene	0.39	U	µg/L	0.39	0.99
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	DNX	36	J	µg/L	0.096	0.49
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	HMX	91	=	µg/L	20	40
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	MNX	33	J	µg/L	0.091	0.49
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	RDX	940	=	µg/L	39	39
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetryl	1.7	J	µg/L	0.2	0.24
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	TNX	23	J	µg/L	0.25	0.49
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1-Trichloroethane	0.65	J	µg/L	0.16	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichlorotrifluoroethane (Freon 113)	28000	J	µg/L	80	600
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethane	3.5	J	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Benzene	0.19	J	µg/L	0.16	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromomethane	8.4	J	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloro methane	6.2	J	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroform	0.51	J	µg/L	0.16	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,2-Dichloroethene	57	J	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Toluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,2-Dichloroethene	0.5	J	µg/L	0.15	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichloroethene	54	J	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Amino-4,6-dinitrotoluene	0.42	J	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Amino-2,6-dinitrotoluene	0.6	=	µg/L	0.12	0.2
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	DNX	0.33	J	µg/L	0.097	0.5
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	HMX	52	=	µg/L	4	8
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	MNX	3.7	=	µg/L	0.29	0.5
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	RDX	140	=	µg/L	8	8
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	TNX	0.25	U	µg/L	0.25	0.5
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Naphthalene	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,1-Trichloroethane	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1,2-Trichlorotrifluoroethane (Freon 113)	710	=	µg/L	4	30
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloroethane	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloroethene	4.2	J	µg/L	2.3	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2,4-Trimethylbenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichloroethane	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3,5-Trimethylbenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	1-Chlorohexane	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Chlorotoluene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	2-Hexanone	40	U	µg/L	40	50
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	4-Isopropyltoluene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Acetone	19	J	µg/L	19	100
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Benzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromobenzene	4	U	µg/L	4	10

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromochloromethane	2	U	µg/L	2	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromodichloromethane	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromoform	10	U	µg/L	10	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Bromomethane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Carbon disulfide	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Carbon tetrachloride	4	U	µg/L	4	20
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloro methane	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chlorobenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloroethane	16	U	µg/L	16	20
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Chloroform	2.2	J	µg/L	1.6	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	cis-1,2-Dichloroethene	2.1	J	µg/L	1.5	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dibromochloromethane	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dibromomethane	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Dichlorodifluoromethane	3.6	J	µg/L	3.1	20
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Ethyl- benzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Isopropylbenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl ethyl ketone	40	U	µg/L	40	60
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl isobutyl ketone	32	U	µg/L	32	50
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Methylene chloride	20	U	µg/L	20	50
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	N-Butylbenzene	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	N-Propylbenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	p-Chlorotoluene	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	sec-Butylbenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Styrene	8	U	µg/L	8	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	tert-Butylbenzene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Tetrachloroethene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Toluene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Trichloroethene	2.1	J	µg/L	1.6	10
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Vinyl chloride	2	U	µg/L	2	15
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Xylene, m,p-	8	U	µg/L	8	20
AOC_RDX-CW_WBP	WBP-TTMW-14	WBP-TTMW-14-0319	WG	3/19/2019	5.8	15.8	Xylene, o-	4	U	µg/L	4	10
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	1,3,5-Trinitrobenzene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	1,3-Dinitrobenzene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	2,4,6-Trinitrotoluene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	2,4-Dinitrotoluene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	2,6-Dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	2-Amino-4,6-dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	2-Nitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	3-Nitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	4-Amino-2,6-dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	4-Nitrotoluene	0.5	U	mg/kg	0.5	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	HMX	0.25	U	mg/kg	0.25	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Nitrobenzene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	RDX	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Tetryl	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Aluminum	1390	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Antimony	0.42	UJ	mg/kg	0.42	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Arsenic	10.1	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Barium	65	J	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Beryllium	0.23	J	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Cadmium	0.05	U	mg/kg	0.05	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Calcium	1560	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Chromium	4	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Cobalt	9.5	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Copper	3	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Iron	11400	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Lead	8.8	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Magnesium	712	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Manganese	558	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Mercury	0.02	U	mg/kg	0.02	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Nickel	6.2	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Potassium	141	J	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Selenium	0.31	UJ	mg/kg	0.31	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Silver	0.05	U	mg/kg	0.05	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Sodium	263	=	mg/kg		
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Thallium	0.48	U	mg/kg	0.48	
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Vanadium	13.5	=	mg/kg		

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_SD_WBP	SC08-H	SC08-H-20000926-SD	SE	9/26/2000	0	0	Zinc	13.6	J	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	1,3,5-Trinitrobenzene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	1,3-Dinitrobenzene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	2,4,6-Trinitrotoluene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	2,4-Dinitrotoluene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	2,6-Dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	2-Amino-4,6-dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	2-Nitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	3-Nitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	4-Amino-2,6-dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	4-Nitrotoluene	0.5	U	mg/kg	0.5	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	HMX	0.25	U	mg/kg	0.25	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Nitrobenzene	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	RDX	0.1	U	mg/kg	0.1	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Tetryl	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Aluminum	2230	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Antimony	0.45	UJ	mg/kg	0.45	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Arsenic	15.7	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Barium	262	J	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Beryllium	0.49	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Cadmium	0.06	U	mg/kg	0.06	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Calcium	4100	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Chromium	7.3	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Cobalt	14.5	J	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Copper	4.6	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Iron	19700	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Lead	14.2	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Magnesium	1110	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Manganese	1400	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Mercury	0.02	U	mg/kg	0.02	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Nickel	10.7	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Potassium	213	J	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Selenium	0.34	UJ	mg/kg	0.34	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Silver	0.05	U	mg/kg	0.05	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Sodium	561	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Thallium	0.52	U	mg/kg	0.52	
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Vanadium	30.3	=	mg/kg		
AOC_SD_WBP	SC09-H	SC09-H-20000926-SD	SE	9/26/2000	0	0	Zinc	26	J	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	1,3,5-Trinitrobenzene	0.09	U	mg/kg	0.09	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	1,3-Dinitrobenzene	0.09	U	mg/kg	0.09	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	2,4,6-Trinitrotoluene	0.09	U	mg/kg	0.09	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	2,4-Dinitrotoluene	0.09	U	mg/kg	0.09	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	2,6-Dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	2-Amino-4,6-dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	2-Nitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	3-Nitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	4-Amino-2,6-dinitrotoluene	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	4-Nitrotoluene	0.49	U	mg/kg	0.49	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	HMX	0.25	U	mg/kg	0.25	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Nitrobenzene	0.09	U	mg/kg	0.09	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	RDX	0.09	U	mg/kg	0.09	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Tetryl	0.2	U	mg/kg	0.2	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Aluminum	2360	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Antimony	0.48	UJ	mg/kg	0.48	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Arsenic	16.3	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Barium	294	J	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Beryllium	0.49	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Cadmium	0.21	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Calcium	7220	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Chromium	7.3	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Cobalt	33.8	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Copper	5.8	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Iron	20700	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Lead	16.4	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Magnesium	747	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Manganese	3660	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Mercury	0.02	U	mg/kg	0.02	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Nickel	13.4	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Potassium	251	J	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Selenium	0.45	J	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Silver	0.05	J	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Sodium	435	=	mg/kg		

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Thallium	0.55	U	mg/kg	0.55	
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Vanadium	25.4	=	mg/kg		
AOC_SD_WBP	SC13-H	SC13-H-20000926-SD	SE	9/26/2000	0	0	Zinc	22.2	J	mg/kg		
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Aluminum, Dissolved	220	=	ug/L	40	50
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Antimony, Dissolved	4	U	ug/L	4	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Arsenic, Dissolved	8	U	ug/L	8	10
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Barium, Dissolved	130	=	ug/L	1.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Beryllium, Dissolved	0.4	U	ug/L	0.4	0.5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Cadmium, Dissolved	0.4	U	ug/L	0.4	0.5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Calcium, Dissolved	74000	=	ug/L	90	100
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Chromium, Dissolved	8	U	ug/L	8	10
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Cobalt, Dissolved	1.8	U	ug/L	1.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Copper, Dissolved	2.2	J	ug/L	1.9	3
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Iron, Dissolved	180	=	ug/L	40	50
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Lead, Dissolved	2	U	ug/L	2	3
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Magnesium, Dissolved	27000	=	ug/L	40	50
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Manganese, Dissolved	150	=	ug/L	3	4
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Mercury, Dissolved	0.15	U	ug/L	0.15	0.2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Nickel, Dissolved	4	U	ug/L	4	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Potassium, Dissolved	9900	=	ug/L	90	100
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Selenium, Dissolved	4	U	ug/L	4	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Silver, Dissolved	1.8	U	ug/L	1.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Sodium, Dissolved	96000	=	µg/L	90	100
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Thallium, Dissolved	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Vanadium, Dissolved	8	U	µg/L	8	10
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Zinc, Dissolved	15	U	µg/L	15	20
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,3,5-Trinitrobenzene	0.43	U	µg/L	0.43	1.1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,3-Dinitrobenzene	0.22	U	µg/L	0.22	0.43
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	2,4,6-Trinitrotoluene	0.43	U	µg/L	0.43	0.43
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	2,4-Dinitrotoluene	0.22	U	µg/L	0.22	0.43
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	2,6-Dinitrotoluene	0.22	U	µg/L	0.22	0.22
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	2-Amino-4,6-dinitrotoluene	0.13	UJ	µg/L	0.13	0.22
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	2-Nitrotoluene	0.22	UJ	µg/L	0.22	0.43
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	3-Nitrotoluene	0.43	UJ	µg/L	0.43	0.43
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	4-Amino-2,6-dinitrotoluene	0.13	UJ	µg/L	0.13	0.22
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	4-Nitrotoluene	0.43	UJ	µg/L	0.43	1.1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	DNX	0.27	U	µg/L	0.27	0.54
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	HMX	0.22	U	µg/L	0.22	0.43
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	MNX	0.31	U	µg/L	0.31	0.54
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Nitrobenzene	0.22	UJ	µg/L	0.22	0.43
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	RDX	0.43	U	µg/L	0.43	0.43
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Tetryl	0.22	U	µg/L	0.22	0.26
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	TNX	0.27	U	µg/L	0.27	0.54
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Aluminum	1600	=	µg/L	40	50
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Antimony	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Arsenic	8	U	µg/L	8	10
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Barium	130	=	µg/L	1.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Beryllium	0.4	U	µg/L	0.4	0.5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Calcium	71000	=	µg/L	90	100
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Chromium	8	U	µg/L	8	10
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Cobalt	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Copper	2.5	J	µg/L	1.9	3
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Iron	1400	=	µg/L	40	50
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Lead	2	U	µg/L	2	3
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Magnesium	27000	=	µg/L	40	50
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Manganese	170	=	µg/L	3	4
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Mercury	0.15	U	µg/L	0.15	0.2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Molybdenum	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Molybdenum, Dissolved	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Nickel	2.2	J	µg/L	2	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Potassium	9700	=	µg/L	90	100
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Selenium	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Silver	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Sodium	95000	=	µg/L	90	100
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Thallium	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Vanadium	4.4	J	µg/L	4	10
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Zinc	15	U	µg/L	15	20
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Naphthalene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	2-Hexanone	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Acetone	6.4	U	µg/L	6.4	10
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Benzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Bromoform	1	UJ	µg/L	1	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Chloro methane	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Chloroethane	1.6	U	µg/L	1.6	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Chloroform	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Methylene chloride	2	U	µg/L	2	5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Styrene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Toluene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW02	EDA-SW02-0319	WS	3/12/2019	0	0	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	DNX	0.25	U	µg/L	0.25	0.51
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	HMX	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	MNX	0.29	U	µg/L	0.29	0.51
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	RDX	0.4	U	µg/L	0.4	0.4
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_SW_WBP	EDA-SW03	EDA-SW03-0319	WS	3/19/2019	0	0	TNX	0.25	U	µg/L	0.25	0.51
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Aluminum, Dissolved	40	U	µg/L	40	50
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Antimony, Dissolved	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Arsenic, Dissolved	8	U	µg/L	8	10
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Barium, Dissolved	130	=	µg/L	1.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Beryllium, Dissolved	0.4	U	µg/L	0.4	0.5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Cadmium, Dissolved	0.4	U	µg/L	0.4	0.5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Calcium, Dissolved	99000	J	µg/L	90	100
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Chromium, Dissolved	8	U	µg/L	8	10
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Cobalt, Dissolved	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Copper, Dissolved	2.5	U	µg/L	2.5	3
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Iron, Dissolved	21	J	µg/L	20	50
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Lead, Dissolved	2	U	µg/L	2	3
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Magnesium, Dissolved	36000	J	µg/L	40	50
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Manganese, Dissolved	150	=	µg/L	3	4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Mercury, Dissolved	0.15	U	µg/L	0.15	0.2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Nickel, Dissolved	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Potassium, Dissolved	11000	J	µg/L	90	100
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Selenium, Dissolved	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Silver, Dissolved	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Sodium, Dissolved	140000	J	µg/L	90	100
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Thallium, Dissolved	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Vanadium, Dissolved	8	U	µg/L	8	10
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Zinc, Dissolved	8.3	J	µg/L	7.5	20
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	DNX	0.25	U	µg/L	0.25	0.5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	HMX	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	MNX	0.29	U	µg/L	0.29	0.5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	RDX	0.4	U	µg/L	0.4	0.4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	TNX	0.25	U	µg/L	0.25	0.5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Aluminum	750	=	µg/L	40	50
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Antimony	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Arsenic	8	U	µg/L	8	10
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Barium	120	=	µg/L	1.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Beryllium	0.4	U	µg/L	0.4	0.5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Calcium	80000	J	µg/L	90	100
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Chromium	8	U	µg/L	8	10
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Cobalt	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Copper	2.5	U	µg/L	2.5	3
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Iron	720	=	µg/L	40	50
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Lead	2	U	µg/L	2	3
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Magnesium	31000	J	µg/L	40	50
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Manganese	140	J	µg/L	3	4
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Mercury	0.15	U	µg/L	0.15	0.2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Molybdenum	2.8	J	µg/L	2	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Molybdenum, Dissolved	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Nickel	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Potassium	8500	J	µg/L	90	100
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Selenium	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Silver	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Sodium	120000	J	µg/L	90	100
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Thallium	1.8	U	µg/L	1.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Vanadium	8	U	µg/L	8	10

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Zinc	15	U	µg/L	15	20
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Naphthalene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.1	J	µg/L	0.18	3
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	2-Hexanone	4	U	µg/L	4	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Acetone	6.4	U	µg/L	6.4	10
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Benzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Bromoform	1	U	µg/L	1	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Bromomethane	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Chloro methane	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Chloroethane	1.6	U	µg/L	1.6	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Chloroform	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Methylene chloride	2	U	µg/L	2	5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Styrene	0.8	U	µg/L	0.8	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Toluene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_SW_WBP	EDA-SW04	EDA-SW04-0319	WS	3/19/2019	0	0	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,3,5-Trinitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	2,4,6-Trinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	2-Amino-4,6-dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	2-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	3-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	4-Amino-2,6-dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	4-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	DNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	HMX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	MNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Nitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	RDX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Tetryl	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	TNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,1,1-Trichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,1,2,2-Tetrachloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,1,2-Trichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,1,2-Trichlorotrifluoroethane (Freon 113)	195	=	µg/L		
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,1-Dichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,1-Dichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,2-Dichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	1,2-Dichloropropane	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	2-Hexanone	10	U	µg/L	10	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Acetone	25	U	µg/L	25	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Benzene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Bromodichloromethane	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Bromoform	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Bromomethane	2	U	µg/L	2	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Carbon disulfide	2	U	µg/L	2	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Carbon tetrachloride	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Chloro methane	2	U	µg/L	2	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Chlorobenzene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Chloroethane	2	U	µg/L	2	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Chloroform	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	cis-1,2-Dichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	cis-1,3-Dichloropropene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Dibromochloromethane	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Ethyl- benzene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Methyl ethyl ketone	5	U	µg/L	5	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Methyl isobutyl ketone	5	U	µg/L	5	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Methylene chloride	5	U	µg/L	5	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Styrene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Tetrachloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Toluene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	trans-1,2-Dichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	trans-1,3-Dichloropropene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Trichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Vinyl chloride	1	U	µg/L	1	
AOC_SW_WBP	SC2	SC2-020812	WS	2/8/2012	0	0	Xylenes, total	3	U	µg/L	3	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,3,5-Trinitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	2,4,6-Trinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	2-Amino-4,6-dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	2-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	3-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	4-Amino-2,6-dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	4-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	DNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	HMX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	MNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Nitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	RDX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Tetryl	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	TNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,1,1-Trichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,1,2,2-Tetrachloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,1,2-Trichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,1,2-Trichlorotrifluoroethane (Freon 113)	127	=	µg/L		
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,1-Dichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,1-Dichloroethene	0.38	J	µg/L		
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,2-Dichloroethane	1	U	µg/L	1	

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	1,2-Dichloropropane	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	2-Hexanone	10	U	µg/L	10	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Acetone	25	U	µg/L	25	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Benzene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Bromodichloromethane	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Bromoform	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Bromomethane	2	U	µg/L	2	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Carbon disulfide	2	U	µg/L	2	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Carbon tetrachloride	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Chloro methane	2	U	µg/L	2	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Chlorobenzene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Chloroethane	2	U	µg/L	2	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Chloroform	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	cis-1,2-Dichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	cis-1,3-Dichloropropene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Dibromochloromethane	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Ethyl- benzene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Methyl ethyl ketone	5	U	µg/L	5	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Methyl isobutyl ketone	5	U	µg/L	5	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Methylene chloride	5	U	µg/L	5	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Styrene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Tetrachloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Toluene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	trans-1,2-Dichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	trans-1,3-Dichloropropene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Trichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Vinyl chloride	1	U	µg/L	1	
AOC_SW_WBP	SC5-TT	SC5-020812	WS	2/8/2012	0	0	Xylenes, total	3	U	µg/L	3	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,3,5-Trinitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	2,4,6-Trinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	2-Amino-4,6-dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	2-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	3-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	4-Amino-2,6-dinitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	4-Nitrotoluene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	DNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	HMX	0.28	=	µg/L		
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	MNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Nitrobenzene	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	RDX	0.42	=	µg/L		
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Tetryl	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	TNX	0.19	U	µg/L	0.19	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,1,1-Trichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,1,2,2-Tetrachloroethane	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,1,2-Trichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,1,2-Trichlorotrifluoroethane (Freon 113)	216	=	µg/L		
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,1-Dichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,1-Dichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,2-Dichloroethane	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	1,2-Dichloropropane	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	2-Hexanone	10	U	µg/L	10	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Acetone	25	U	µg/L	25	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Benzene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Bromodichloromethane	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Bromoform	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Bromomethane	2	U	µg/L	2	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Carbon disulfide	2	U	µg/L	2	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Carbon tetrachloride	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Chloro methane	2	U	µg/L	2	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Chlorobenzene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Chloroethane	2	U	µg/L	2	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Chloroform	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	cis-1,2-Dichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	cis-1,3-Dichloropropene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Dibromochloromethane	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Ethyl- benzene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Methyl ethyl ketone	5	U	µg/L	5	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Methyl isobutyl ketone	5	U	µg/L	5	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Methylene chloride	5	U	µg/L	5	

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Styrene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Tetrachloroethene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Toluene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	trans-1,2-Dichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	trans-1,3-Dichloropropene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Trichloroethene	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Vinyl chloride	1	U	µg/L	1	
AOC_SW_WBP	SCT2	SCT2-020812	WS	2/8/2012	0	0	Xylenes, total	3	U	µg/L	3	
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	J	µg/L	0.059	0.2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	DNX	0.76	J	µg/L	0.26	0.51
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	HMX	450	=	µg/L	20	41
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	MNX	2.4	=	µg/L	0.3	0.51
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	RDX	35	J	µg/L	16	41
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	TNX	0.26	U	µg/L	0.26	0.51
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Arsenic	8	U	µg/L	8	10
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Barium	260	=	µg/L	1.8	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chromium	8	U	µg/L	8	10
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Lead	2	U	µg/L	2	3
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Selenium	4	U	µg/L	4	5
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	6.1	J	µg/L	0.4	3
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	0.33	J	µg/L	0.31	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichloroethene	0.17	J	µg/L	0.16	1
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	DNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	HMX	2.6	=	µg/L	0.2	0.4
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	MNX	0.29	U	µg/L	0.29	0.5
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	RDX	0.4	U	µg/L	0.4	0.4
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	TNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.63	U	µg/L	0.4	3
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Hexanone	4	U	µg/L	4	5

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromoform	1	U	µg/L	1	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.99
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dinitrobenzene	2.8	J	µg/L	0.2	0.39
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,6-Dinitrotoluene	1	J	µg/L	0.2	0.2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Nitrotoluene	0.39	U	µg/L	0.39	0.99
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	DNX	36	J	µg/L	0.096	0.49
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	HMX	91	=	µg/L	20	40
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	MNX	33	J	µg/L	0.091	0.49
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	RDX	940	=	µg/L	39	39
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetryl	1.7	J	µg/L	0.2	0.24
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	TNX	23	J	µg/L	0.25	0.49
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1-Trichloroethane	0.65	J	µg/L	0.16	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichlorotrifluoroethane (Freon 113)	28000	J	µg/L	80	600
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethane	3.5	J	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Benzene	0.19	J	µg/L	0.16	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromomethane	8.4	J	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloro methane	6.2	J	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroform	0.51	J	µg/L	0.16	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,2-Dichloroethene	57	J	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,2-Dichloroethene	0.5	J	µg/L	0.15	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichloroethene	54	J	µg/L	0.4	1
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Amino-2,6-dinitrotoluene	0.12	J	µg/L	0.059	0.2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	DNX	0.76	J	µg/L	0.26	0.51
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	HMX	450	=	µg/L	20	41
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	MNX	2.4	=	µg/L	0.3	0.51
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	RDX	35	J	µg/L	16	41
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	TNX	0.26	U	µg/L	0.26	0.51
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Barium	260	=	µg/L	1.8	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Cadmium	0.4	U	µg/L	0.4	0.5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Lead	2	U	µg/L	2	3
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1,2-Trichlorotrifluoroethane (Freon 113)	6.1	J	µg/L	0.4	3
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Dichlorodifluoromethane	0.33	J	µg/L	0.31	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichloroethene	0.17	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	JAW-23	JAW-23-0319	WG	3/22/2019	5	10	Xylene, o-	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3,5-Trinitrobenzene	0.41	UJ	µg/L	0.41	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,4,6-Trinitrotoluene	0.41	UJ	µg/L	0.41	0.41
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,6-Dinitrotoluene	0.34	J	µg/L	0.2	0.2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	3-Nitrotoluene	0.41	UJ	µg/L	0.41	0.41
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Nitrotoluene	0.41	UJ	µg/L	0.41	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	DNX	0.3	J	µg/L	0.099	0.51
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	HMX	0.2	UJ	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	MNX	0.29	UJ	µg/L	0.29	0.51
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Nitrobenzene	0.2	UJ	µg/L	0.2	0.41
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	RDX	0.41	UJ	µg/L	0.41	0.41
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	TNX	1.6	J	µg/L	0.25	0.51
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Naphthalene	1.6	J	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	J	µg/L	800	6000
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2,4-Trimethylbenzene	3.9	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3,5-Trimethylbenzene	1.3	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	4-Isopropyltoluene	0.7	J	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Benzene	0.47	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Bromomethane	1.3	J	µg/L	0.21	2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Carbon disulfide	68	J	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Ethyl- benzene	1.9	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Isopropylbenzene	0.36	J	µg/L	0.19	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	N-Butylbenzene	0.93	J	µg/L	0.14	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	N-Propylbenzene	0.61	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	sec-Butylbenzene	0.69	J	µg/L	0.17	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Toluene	8.1	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Trichloroethene	0.26	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Xylene, m,p-	2.9	J	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-99-6	WBP-99-6-0319	WG	3/22/2019	30	40	Xylene, o-	2.8	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3,5-Trinitrobenzene	0.21	U	µg/L	0.21	0.22
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dinitrobenzene	0.1	U	µg/L	0.1	0.11
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,4,6-Trinitrotoluene	0.1	U	µg/L	0.1	0.11
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,4-Dinitrotoluene	0.082	U	µg/L	0.082	0.1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,6-Dinitrotoluene	0.082	U	µg/L	0.082	0.1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Amino-4,6-dinitrotoluene	0.1	U	µg/L	0.1	0.11
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Nitrotoluene	0.21	U	µg/L	0.21	0.22
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.15
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Nitrotoluene	0.41	U	µg/L	0.41	0.42
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	DNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	HMX	0.21	U	µg/L	0.21	0.22
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	MNX	0.3	U	µg/L	0.3	0.52
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Nitrobenzene	0.21	U	µg/L	0.21	0.22
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	RDX	0.21	U	µg/L	0.21	0.22
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Tetryl	0.1	U	µg/L	0.1	0.11
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	TNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromoform	1	U	µg/L	1	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Bromomethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW6	WBP-MW6-0520	WG	5/7/2020	29	39	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	DNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	HMX	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	MNX	0.29	U	µg/L	0.29	0.5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	RDX	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	TNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Barium	130	=	µg/L	1.8	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Lead	1.2	J	µg/L	1	3
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Naphthalene	1.3	J	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1,2-Trichlorotrifluoroethane (Freon 113)	30000	J	µg/L	160	1200
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2,4-Trimethylbenzene	1.9	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3,5-Trimethylbenzene	0.58	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	1-Chlorohexane	0.31	J	µg/L	0.19	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	4-Isopropyltoluene	0.56	J	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Chloroform	2.1	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Ethyl- benzene	0.43	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	N-Butylbenzene	0.8	J	µg/L	0.14	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	N-Propylbenzene	0.23	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	sec-Butylbenzene	0.49	J	µg/L	0.17	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Toluene	1.2	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Xylene, m,p-	1.1	J	µg/L	0.15	2
AOC_VOC-Plume-West_WBP	WBP-MW9	WBP-MW9-0319	WG	3/23/2019	70	80	Xylene, o-	0.62	J	µg/L	0.19	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	DNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	HMX	2.6	=	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	MNX	0.29	U	µg/L	0.29	0.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	RDX	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	TNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.63	U	µg/L	0.4	3

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromoform	1	U	µg/L	1	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-05B	WBP-TTMW-05B-0319	WG	3/23/2019	1.4	6.4	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Amino-4,6-dinitrotoluene	0.068	J	µg/L	0.051	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	3-Nitrotoluene	0.4	UJ	µg/L	0.4	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	DNX	0.33	J	µg/L	0.098	0.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	HMX	29	=	µg/L	2	4
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	MNX	4	=	µg/L	0.29	0.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	RDX	120	=	µg/L	4	4
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Tetryl	0.2	U	µg/L	0.2	0.24

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	TNX	3.1	=	µg/L	0.25	0.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Barium	91	=	µg/L	1.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Lead	2	U	µg/L	2	3
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Selenium	2.8	J	µg/L	2	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,1-Trichloroethane	0.43	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1,2-Trichlorotrifluoroethane (Freon 113)	12000	J	µg/L	40	300
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloroethane	1	J	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloroethene	47	J	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Acetone	380	J	µg/L	6.4	10
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Bromomethane	3.8	J	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloro methane	2.9	J	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Chloroform	0.33	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	cis-1,2-Dichloroethene	9.6	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Dichlorodifluoromethane	69	J	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Trichloroethene	13	J	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-06	WBP-TTMW-06-0319	WG	3/23/2019	3	8	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.99
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dinitrobenzene	2.8	J	µg/L	0.2	0.39
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,6-Dinitrotoluene	1	J	µg/L	0.2	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Nitrotoluene	0.39	U	µg/L	0.39	0.99
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	DNX	36	J	µg/L	0.096	0.49
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	HMX	91	=	µg/L	20	40
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	MNX	33	J	µg/L	0.091	0.49
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	RDX	940	=	µg/L	39	39
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetryl	1.7	J	µg/L	0.2	0.24
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	TNX	23	J	µg/L	0.25	0.49
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,1-Trichloroethane	0.65	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1,2-Trichlorotrifluoroethane (Freon 113)	28000	J	µg/L	80	600
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethane	3.5	J	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Benzene	0.19	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Bromomethane	8.4	J	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloro methane	6.2	J	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Chloroform	0.51	J	µg/L	0.16	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,2-Dichloroethene	57	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,2-Dichloroethene	0.5	J	µg/L	0.15	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichloroethene	54	J	µg/L	0.4	1
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-West_WBP	WBP-TTMW-11	WBP-TTMW-11-0319	WG	3/22/2019	6.7	21.7	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trinitrobenzene	0.39	UJ	µg/L	0.39	0.98
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4,6-Trinitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,6-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Amino-2,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.98
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	DNX	0.25	UJ	µg/L	0.25	0.49
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	HMX	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	MNX	0.28	UJ	µg/L	0.28	0.49
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Nitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	RDX	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	TNX	0.25	U	µg/L	0.25	0.49
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Arsenic	8	U	µg/L	8	10
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Barium	15	=	µg/L	1.8	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chromium	8	U	µg/L	8	10
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Lead	2	U	µg/L	2	3
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Selenium	4	U	µg/L	4	5
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.1	U	µg/L	0.4	3
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromoform	1	U	µg/L	1	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	DNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	HMX	0.21	U	µg/L	0.21	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	MNX	0.3	U	µg/L	0.3	0.52
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	RDX	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	TNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Naphthalene	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trichlorobenzene	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichlorobenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichlorobenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,4-Dichlorobenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Hexachlorobutadiene	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1-Trichloroethane	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichloroethane	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichlorotrifluoroethane (Freon 113)	4600	=	µg/L	40	300
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethane	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethene	29	=	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloropropene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichlorobenzene	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichloropropane	16	U	µg/L	16	60
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trimethylbenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromo-3-chloropropane	32	U	µg/L	32	100
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromoethane	8	U	µg/L	8	20

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloroethane	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloropropane	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trimethylbenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichloropropane	4	U	µg/L	4	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1-Chlorohexane	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,2-Dichloropropane	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Chlorotoluene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Hexanone	80	U	µg/L	80	100
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Isopropyltoluene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Acetone	130	U	µg/L	130	200
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Benzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromobenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromochloromethane	4	U	µg/L	4	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromodichloromethane	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromoform	20	U	µg/L	20	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromomethane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon disulfide	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon tetrachloride	8	U	µg/L	8	40
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloro methane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chlorobenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroethane	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroform	6.7	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromochloromethane	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromomethane	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dichlorodifluoromethane	230	=	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Ethyl- benzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Isopropylbenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl ethyl ketone	80	U	µg/L	80	120
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl isobutyl ketone	64	U	µg/L	64	100
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl tert-butyl ether (MTBE)	16	U	µg/L	16	100
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methylene chloride	40	U	µg/L	40	100
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Butylbenzene	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Propylbenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	p-Chlorotoluene	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	sec-Butylbenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Styrene	16	U	µg/L	16	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	tert-Butylbenzene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetrachloroethene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Toluene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichloroethene	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichlorofluoromethane (Freon 11)	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Vinyl chloride	4	U	µg/L	4	30
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, m,p-	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, o-	8	U	µg/L	8	20
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Amino-4,6-dinitrotoluene	0.51	J	µg/L	0.12	0.2
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Amino-2,6-dinitrotoluene	1.1	J	µg/L	0.12	0.2
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	DNX	4.7	J	µg/L	0.26	0.51
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	HMX	170	=	µg/L	2	4.1
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	MNX	1.7	=	µg/L	0.3	0.51
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	RDX	51	=	µg/L	4.1	4.1
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	TNX	0.26	U	µg/L	0.26	0.51
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Naphthalene	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	5900	=	µg/L	40	300
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethane	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethene	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trimethylbenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloroethane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trimethylbenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1-Chlorohexane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Chlorotoluene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Hexanone	160	U	µg/L	160	200
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Acetone	260	U	µg/L	260	400
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Benzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromobenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromochloromethane	8	U	µg/L	8	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromodichloromethane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromoform	40	U	µg/L	40	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromomethane	32	U	µg/L	32	80
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon disulfide	32	U	µg/L	32	80
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon tetrachloride	16	U	µg/L	16	80
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloro methane	32	U	µg/L	32	80
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chlorobenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroethane	64	U	µg/L	64	80
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroform	12	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromochloromethane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromomethane	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dichlorodifluoromethane	79	J	µg/L	12	80
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Ethyl- benzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Isopropylbenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl ethyl ketone	160	U	µg/L	160	240
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl isobutyl ketone	130	U	µg/L	130	200
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methylene chloride	80	U	µg/L	80	200
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Butylbenzene	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Propylbenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	p-Chlorotoluene	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	sec-Butylbenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Styrene	32	U	µg/L	32	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	tert-Butylbenzene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetrachloroethene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Toluene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichloroethene	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Vinyl chloride	8	U	µg/L	8	60
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, m,p-	32	U	µg/L	32	80
AOC_VOC-CW-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, o-	16	U	µg/L	16	40
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Amino-2,6-dinitrotoluene	0.26	J	µg/L	0.12	0.2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	DNX	0.43	J	µg/L	0.097	0.5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	HMX	54	=	µg/L	2	4

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	MNX	0.98	=	µg/L	0.29	0.5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	RDX	12	=	µg/L	0.4	0.4
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Arsenic	8	U	µg/L	8	10
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Barium	640	=	µg/L	1.8	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Cadmium	0.63	=	µg/L	0.4	0.5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chromium	8	U	µg/L	8	10
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Lead	2	U	µg/L	2	3
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Selenium	4	U	µg/L	4	5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Naphthalene	0.27	J	µg/L	0.22	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	=	µg/L	16	120
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethane	0.37	J	µg/L	0.22	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethene	11	=	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trimethylbenzene	0.29	J	µg/L	0.15	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Acetone	92	=	µg/L	6.4	10
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromoform	1	U	µg/L	1	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,2-Dichloroethene	0.49	J	µg/L	0.15	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dichlorodifluoromethane	140	=	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetrachloroethene	0.4	U	µg/L	0.4	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Toluene	0.41	J	µg/L	0.17	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichloroethene	0.77	J	µg/L	0.16	1
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, m,p-	0.24	J	µg/L	0.15	2
AOC_VOC-CW-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, o-	0.25	J	µg/L	0.19	1
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	DNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	HMX	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	MNX	0.3	U	µg/L	0.3	0.52
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	RDX	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	TNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Arsenic	37	=	µg/L	8	10
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Barium	960	J	µg/L	1.8	2
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Lead	2	U	µg/L	2	3
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume-East_WBP	WBP-99-5	WPB-99-5-0319	WG	3/7/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trinitrobenzene	0.39	UJ	µg/L	0.39	0.98
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dinitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4,6-Trinitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,4-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,6-Dinitrotoluene	0.2	UJ	µg/L	0.2	0.2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Amino-4,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Amino-2,6-dinitrotoluene	0.12	UJ	µg/L	0.12	0.2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.98
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	DNX	0.25	UJ	µg/L	0.25	0.49
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	HMX	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	MNX	0.28	UJ	µg/L	0.28	0.49
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Nitrobenzene	0.2	UJ	µg/L	0.2	0.39
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	RDX	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetryl	0.2	UJ	µg/L	0.2	0.24
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	TNX	0.25	U	µg/L	0.25	0.49
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Barium	15	=	µg/L	1.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Lead	2	U	µg/L	2	3
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.1	U	µg/L	0.4	3
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromoform	1	U	µg/L	1	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-MW1	WBP-MW1-0319	WG	3/23/2019	35.5	45.5	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	DNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	HMX	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	MNX	0.3	U	µg/L	0.3	0.52
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	RDX	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	TNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Naphthalene	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trichlorobenzene	16	U	µg/L	16	20

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichlorobenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichlorobenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,4-Dichlorobenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Hexachlorobutadiene	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,1-Trichloroethane	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2,2-Tetrachloroethane	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichloroethane	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1,2-Trichlorotrifluoroethane (Freon 113)	4600	=	µg/L	40	300
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethane	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloroethene	29	=	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,1-Dichloropropene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichlorobenzene	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,3-Trichloropropane	16	U	µg/L	16	60
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2,4-Trimethylbenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromo-3-chloropropane	32	U	µg/L	32	100
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dibromoethane	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloroethane	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,2-Dichloropropane	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3,5-Trimethylbenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1,3-Dichloropropane	4	U	µg/L	4	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	1-Chlorohexane	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2,2-Dichloropropane	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Chlorotoluene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	2-Hexanone	80	U	µg/L	80	100
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	4-Isopropyltoluene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Acetone	130	U	µg/L	130	200
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Benzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromobenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromochloromethane	4	U	µg/L	4	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromodichloromethane	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromoform	20	U	µg/L	20	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Bromomethane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon disulfide	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Carbon tetrachloride	8	U	µg/L	8	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloro methane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chlorobenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroethane	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Chloroform	6.7	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	cis-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromochloromethane	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dibromomethane	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Dichlorodifluoromethane	230	=	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Ethyl- benzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Isopropylbenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl ethyl ketone	80	U	µg/L	80	120
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl isobutyl ketone	64	U	µg/L	64	100
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methyl tert-butyl ether (MTBE)	16	U	µg/L	16	100
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Methylene chloride	40	U	µg/L	40	100
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Butylbenzene	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	N-Propylbenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	p-Chlorotoluene	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	sec-Butylbenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Styrene	16	U	µg/L	16	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	tert-Butylbenzene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Tetrachloroethene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Toluene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,2-Dichloroethene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	trans-1,3-Dichloropropene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichloroethene	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Trichlorofluoromethane (Freon 11)	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Vinyl chloride	4	U	µg/L	4	30
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, m,p-	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-01	WBP-TTMW-01-0319	WG	3/7/2019	1	5.11	Xylene, o-	8	U	µg/L	8	20
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Amino-4,6-dinitrotoluene	0.51	J	µg/L	0.12	0.2
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Amino-2,6-dinitrotoluene	1.1	J	µg/L	0.12	0.2
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	DNX	4.7	J	µg/L	0.26	0.51
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	HMX	170	=	µg/L	2	4.1
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	MNX	1.7	=	µg/L	0.3	0.51
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	RDX	51	=	µg/L	4.1	4.1
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	TNX	0.26	U	µg/L	0.26	0.51
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Naphthalene	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	5900	=	µg/L	40	300
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethane	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloroethene	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2,4-Trimethylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloroethane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3,5-Trimethylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	1-Chlorohexane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Chlorotoluene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	2-Hexanone	160	U	µg/L	160	200
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Acetone	260	U	µg/L	260	400
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Benzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromobenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromochloromethane	8	U	µg/L	8	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromodichloromethane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromoform	40	U	µg/L	40	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Bromomethane	32	U	µg/L	32	80
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon disulfide	32	U	µg/L	32	80
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Carbon tetrachloride	16	U	µg/L	16	80
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloro methane	32	U	µg/L	32	80
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chlorobenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroethane	64	U	µg/L	64	80
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Chloroform	12	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromochloromethane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dibromomethane	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Dichlorodifluoromethane	79	J	µg/L	12	80
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Ethyl- benzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Isopropylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl ethyl ketone	160	U	µg/L	160	240
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl isobutyl ketone	130	U	µg/L	130	200
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Methylene chloride	80	U	µg/L	80	200
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Butylbenzene	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	N-Propylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	p-Chlorotoluene	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	sec-Butylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Styrene	32	U	µg/L	32	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	tert-Butylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Tetrachloroethene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Toluene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	trans-1,3-Dichloropropene	16	U	µg/L	16	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichloroethene	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Vinyl chloride	8	U	µg/L	8	60
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, m,p-	32	U	µg/L	32	80
AOC_VOC-Plume-East_WBP	WBP-TTMW-02	WBP-TTMW-02-0319	WG	3/7/2019	1	6.5	Xylene, o-	16	U	µg/L	16	40
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Amino-2,6-dinitrotoluene	0.26	J	µg/L	0.12	0.2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	DNX	0.43	J	µg/L	0.097	0.5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	HMX	54	=	µg/L	2	4
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	MNX	0.98	=	µg/L	0.29	0.5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	RDX	12	=	µg/L	0.4	0.4
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Barium	640	=	µg/L	1.8	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Cadmium	0.63	=	µg/L	0.4	0.5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Lead	2	U	µg/L	2	3
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Naphthalene	0.27	J	µg/L	0.22	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	=	µg/L	16	120
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethane	0.37	J	µg/L	0.22	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloroethene	11	=	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2,4-Trimethylbenzene	0.29	J	µg/L	0.15	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Acetone	92	=	µg/L	6.4	10
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromoform	1	U	µg/L	1	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,2-Dichloroethene	0.49	J	µg/L	0.15	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Dichlorodifluoromethane	140	=	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Toluene	0.41	J	µg/L	0.17	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichloroethene	0.77	J	µg/L	0.16	1
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, m,p-	0.24	J	µg/L	0.15	2
AOC_VOC-Plume-East_WBP	WBP-TTMW-03	WBP-TTMW-03-0319	WG	3/22/2019	3.5	8.5	Xylene, o-	0.25	J	µg/L	0.19	1

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit

Notes:
(1) The data were reduced such that when a normal and duplicate sample were available, the highest detected concentration among normal or duplicate samples was used when a chemical was detected in any sample. If both results were non-detect, the lowest reported detection limit (i.e., reporting limit) was used.
NA = Not available
WG - groundwater
J - compound was detected below the reporting limit in the sample
= - detected
U - not detected
µg/L - microgram per liter

ATTACHMENT 3

ProUCL Output - Groundwater (RDX Plume Core), Potable Use Scenario

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/21/2021 12:43:03 PM
From File	ProUCL Input_WBP Plume_Potable.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

2-Amino-4,6-dinitrotoluene

General Statistics

Total Number of Observations	22	Number of Distinct Observations	9
Number of Detects	6	Number of Non-Detects	16
Number of Distinct Detects	6	Number of Distinct Non-Detects	3
Minimum Detect	0.068	Minimum Non-Detect	0.1
Maximum Detect	0.54	Maximum Non-Detect	0.13
Variance Detects	0.0456	Percent Non-Detects	72.73%
Mean Detects	0.34	SD Detects	0.214
Median Detects	0.425	CV Detects	0.628
Skewness Detects	-0.77	Kurtosis Detects	-1.86
Mean of Logged Detects	-1.382	SD of Logged Detects	0.984

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.798	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.144	KM Standard Error of Mean	0.0368
KM SD	0.157	95% KM (BCA) UCL	0.216
95% KM (t) UCL	0.208	95% KM (Percentile Bootstrap) UCL	0.206
95% KM (z) UCL	0.205	95% KM Bootstrap t UCL	0.205
90% KM Chebyshev UCL	0.255	95% KM Chebyshev UCL	0.305
97.5% KM Chebyshev UCL	0.374	99% KM Chebyshev UCL	0.511

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.875	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.706	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.372	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.337	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.792	k star (bias corrected MLE)	1.007
Theta hat (MLE)	0.19	Theta star (bias corrected MLE)	0.338
nu hat (MLE)	21.5	nu star (bias corrected)	12.08
Mean (detects)	0.34		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.17
Maximum	0.54	Median	0.0986
SD	0.165	CV	0.968
k hat (MLE)	1.033	k star (bias corrected MLE)	0.923
Theta hat (MLE)	0.165	Theta star (bias corrected MLE)	0.184
nu hat (MLE)	45.47	nu star (bias corrected)	40.6
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (40.60, α)	27	Adjusted Chi Square Value (40.60, β)	26.17
95% Gamma Approximate UCL (use when n>=50)	0.256	95% Gamma Adjusted UCL (use when n<50)	0.264

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.144	SD (KM)	0.157
Variance (KM)	0.0248	SE of Mean (KM)	0.0368
k hat (KM)	0.843	k star (KM)	0.758
nu hat (KM)	37.08	nu star (KM)	33.35
theta hat (KM)	0.171	theta star (KM)	0.191
80% gamma percentile (KM)	0.237	90% gamma percentile (KM)	0.356
95% gamma percentile (KM)	0.478	99% gamma percentile (KM)	0.767

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (33.35, α)	21.15	Adjusted Chi Square Value (33.35, β)	20.42
95% Gamma Approximate KM-UCL (use when n>=50)	0.228	95% Gamma Adjusted KM-UCL (use when n<50)	0.236

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.727	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.366	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.161	Mean in Log Scale	-2.233
SD in Original Scale	0.161	SD in Log Scale	0.913
95% t UCL (assumes normality of ROS data)	0.22	95% Percentile Bootstrap UCL	0.22
95% BCA Bootstrap UCL	0.228	95% Bootstrap t UCL	0.239
95% H-UCL (Log ROS)	0.266		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.301	KM Geo Mean	0.1
KM SD (logged)	0.734	95% Critical H Value (KM-Log)	2.242
KM Standard Error of Mean (logged)	0.173	95% H-UCL (KM -Log)	0.188
KM SD (logged)	0.734	95% Critical H Value (KM-Log)	2.242
KM Standard Error of Mean (logged)	0.173		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.136	Mean in Log Scale	-2.428
SD in Original Scale	0.165	SD in Log Scale	0.814
95% t UCL (Assumes normality)	0.197	95% H-Stat UCL	0.186

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 0.208

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

4-Amino-2,6-dinitrotoluene

General Statistics

Total Number of Observations	22	Number of Distinct Observations	10
Number of Detects	9	Number of Non-Detects	13
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	0.058	Minimum Non-Detect	0.12
Maximum Detect	1.1	Maximum Non-Detect	0.13
Variance Detects	0.108	Percent Non-Detects	59.09%
Mean Detects	0.378	SD Detects	0.329
Median Detects	0.26	CV Detects	0.871
Skewness Detects	1.43	Kurtosis Detects	2.195
Mean of Logged Detects	-1.33	SD of Logged Detects	0.938

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.195	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.204	KM Standard Error of Mean	0.057
KM SD	0.246	95% KM (BCA) UCL	0.304
95% KM (t) UCL	0.302	95% KM (Percentile Bootstrap) UCL	0.302
95% KM (z) UCL	0.298	95% KM Bootstrap t UCL	0.371
90% KM Chebyshev UCL	0.375	95% KM Chebyshev UCL	0.453
97.5% KM Chebyshev UCL	0.56	99% KM Chebyshev UCL	0.771

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.185	**Anderson-Darling GOF Test**

5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level		
K-S Test Statistic	0.152	**Kolmogorov-Smirnov GOF**		
5% K-S Critical Value	0.284	Detected data appear Gamma Distributed at 5% Significance Level		

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.549	k star (bias corrected MLE)	1.107
Theta hat (MLE)	0.244	Theta star (bias corrected MLE)	0.341
nu hat (MLE)	27.89	nu star (bias corrected)	19.93
Mean (detects)	0.378		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.177
Maximum	1.1	Median	0.0692
SD	0.268	CV	1.513
k hat (MLE)	0.552	k star (bias corrected MLE)	0.507
Theta hat (MLE)	0.321	Theta star (bias corrected MLE)	0.349
nu hat (MLE)	24.29	nu star (bias corrected)	22.31
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (22.31, α)	12.57	Adjusted Chi Square Value (22.31, β)	12.03
95% Gamma Approximate UCL (use when n>=50)	0.314	95% Gamma Adjusted UCL (use when n<50)	0.329

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.204	SD (KM)	0.246
Variance (KM)	0.0606	SE of Mean (KM)	0.057
k hat (KM)	0.689	k star (KM)	0.625
nu hat (KM)	30.3	nu star (KM)	27.5
theta hat (KM)	0.297	theta star (KM)	0.327
80% gamma percentile (KM)	0.336	90% gamma percentile (KM)	0.526
95% gamma percentile (KM)	0.724	99% gamma percentile (KM)	1.201

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (27.50, α)	16.54	Adjusted Chi Square Value (27.50, β)	15.91
95% Gamma Approximate KM-UCL (use when n>=50)	0.34	95% Gamma Adjusted KM-UCL (use when n<50)	0.353

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.977	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.133	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.2	Mean in Log Scale	-2.17
SD in Original Scale	0.255	SD in Log Scale	1.051

95% t UCL (assumes normality of ROS data)	0.294	95% Percentile Bootstrap UCL	0.293
95% BCA Bootstrap UCL	0.337	95% Bootstrap t UCL	0.367
95% H-UCL (Log ROS)	0.365		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.036	KM Geo Mean	0.131
KM SD (logged)	0.852	95% Critical H Value (KM-Log)	2.386
KM Standard Error of Mean (logged)	0.245	95% H-UCL (KM -Log)	0.292
KM SD (logged)	0.852	95% Critical H Value (KM-Log)	2.386
KM Standard Error of Mean (logged)	0.245		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.19	Mean in Log Scale	-2.203
SD in Original Scale	0.258	SD in Log Scale	0.942
95% t UCL (Assumes normality)	0.285	95% H-Stat UCL	0.288

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 0.302

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

HMX

General Statistics

Total Number of Observations	22	Number of Distinct Observations	17
Number of Detects	15	Number of Non-Detects	7
Number of Distinct Detects	15	Number of Distinct Non-Detects	2
Minimum Detect	0.86	Minimum Non-Detect	0.2
Maximum Detect	450	Maximum Non-Detect	0.21
Variance Detects	18445	Percent Non-Detects	31.82%
Mean Detects	94.77	SD Detects	135.8
Median Detects	54	CV Detects	1.433
Skewness Detects	2.044	Kurtosis Detects	3.344
Mean of Logged Detects	3.534	SD of Logged Detects	1.718

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.672	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.34	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	64.68	KM Standard Error of Mean	25.81
KM SD	117	95% KM (BCA) UCL	112.4
95% KM (t) UCL	109.1	95% KM (Percentile Bootstrap) UCL	111
95% KM (z) UCL	107.1	95% KM Bootstrap t UCL	172.1
90% KM Chebyshev UCL	142.1	95% KM Chebyshev UCL	177.2
97.5% KM Chebyshev UCL	225.9	99% KM Chebyshev UCL	321.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.402	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.785	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.197	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.232	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.607	k star (bias corrected MLE)	0.53
Theta hat (MLE)	156.2	Theta star (bias corrected MLE)	178.9
nu hat (MLE)	18.2	nu star (bias corrected)	15.89
Mean (detects)	94.77		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	64.62
Maximum	450	Median	12.5
SD	119.7	CV	1.853
k hat (MLE)	0.224	k star (bias corrected MLE)	0.224
Theta hat (MLE)	288.2	Theta star (bias corrected MLE)	288.6
nu hat (MLE)	9.865	nu star (bias corrected)	9.853
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (9.85, α)	3.85	Adjusted Chi Square Value (9.85, β)	3.574
95% Gamma Approximate UCL (use when n>=50)	165.4	95% Gamma Adjusted UCL (use when n<50)	178.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	64.68	SD (KM)	117
Variance (KM)	13678	SE of Mean (KM)	25.81
k hat (KM)	0.306	k star (KM)	0.294
nu hat (KM)	13.46	nu star (KM)	12.96
theta hat (KM)	211.5	theta star (KM)	219.7
80% gamma percentile (KM)	98.73	90% gamma percentile (KM)	191.2
95% gamma percentile (KM)	297.7	99% gamma percentile (KM)	575

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.96, α)	5.863	Adjusted Chi Square Value (12.96, β)	5.509
95% Gamma Approximate KM-UCL (use when n>=50)	142.9	95% Gamma Adjusted KM-UCL (use when n<50)	152.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.95	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.22	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	64.87	Mean in Log Scale	2.253
SD in Original Scale	119.6	SD in Log Scale	2.423
95% t UCL (assumes normality of ROS data)	108.8	95% Percentile Bootstrap UCL	108.1
95% BCA Bootstrap UCL	122	95% Bootstrap t UCL	183.5
95% H-UCL (Log ROS)	2427		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.898	KM Geo Mean	6.671
KM SD (logged)	2.76	95% Critical H Value (KM-Log)	5.54
KM Standard Error of Mean (logged)	0.609	95% H-UCL (KM -Log)	8460
KM SD (logged)	2.76	95% Critical H Value (KM-Log)	5.54
KM Standard Error of Mean (logged)	0.609		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	64.65	Mean in Log Scale	1.684
SD in Original Scale	119.7	SD in Log Scale	3.107
95% t UCL (Assumes normality)	108.6	95% H-Stat UCL	44263

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 152.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RDX

General Statistics

Total Number of Observations	22	Number of Distinct Observations	18
Number of Detects	14	Number of Non-Detects	8
Number of Distinct Detects	14	Number of Distinct Non-Detects	4
Minimum Detect	3.2	Minimum Non-Detect	0.21
Maximum Detect	940	Maximum Non-Detect	0.41
Variance Detects	59337	Percent Non-Detects	36.36%
Mean Detects	107.3	SD Detects	243.6
Median Detects	36	CV Detects	2.27

Skewness Detects	3.542	Kurtosis Detects	12.89
Mean of Logged Detects	3.409	SD of Logged Detects	1.571

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.444	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.375	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	68.35	KM Standard Error of Mean	42.97
KM SD	194.2	95% KM (BCA) UCL	154.4
95% KM (t) UCL	142.3	95% KM (Percentile Bootstrap) UCL	151
95% KM (z) UCL	139	95% KM Bootstrap t UCL	402.5
90% KM Chebyshev UCL	197.3	95% KM Chebyshev UCL	255.6
97.5% KM Chebyshev UCL	336.7	99% KM Chebyshev UCL	495.9

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.88	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.793	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.205	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.242	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.501	k star (bias corrected MLE)	0.442
Theta hat (MLE)	214	Theta star (bias corrected MLE)	243
nu hat (MLE)	14.04	nu star (bias corrected)	12.36
Mean (detects)	107.3		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	68.28
Maximum	940	Median	8.4
SD	198.8	CV	2.912
k hat (MLE)	0.198	k star (bias corrected MLE)	0.201
Theta hat (MLE)	345.3	Theta star (bias corrected MLE)	339.6
nu hat (MLE)	8.7	nu star (bias corrected)	8.847
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (8.85, α)	3.235	Adjusted Chi Square Value (8.85, β)	2.985
95% Gamma Approximate UCL (use when n>=50)	186.8	95% Gamma Adjusted UCL (use when n<50)	202.3

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	68.35	SD (KM)	194.2
Variance (KM)	37717	SE of Mean (KM)	42.97

k hat (KM)	0.124	k star (KM)	0.137
nu hat (KM)	5.451	nu star (KM)	6.041
theta hat (KM)	551.8	theta star (KM)	497.9
80% gamma percentile (KM)	68.85	90% gamma percentile (KM)	199.8
95% gamma percentile (KM)	382.3	99% gamma percentile (KM)	922.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.04, α)	1.661	Adjusted Chi Square Value (6.04, β)	1.496
95% Gamma Approximate KM-UCL (use when n>=50)	248.6	95% Gamma Adjusted KM-UCL (use when n<50)	276

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.108	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	68.54	Mean in Log Scale	1.983
SD in Original Scale	198.7	SD in Log Scale	2.327
95% t UCL (assumes normality of ROS data)	141.4	95% Percentile Bootstrap UCL	147.1
95% BCA Bootstrap UCL	200.1	95% Bootstrap t UCL	398.7
95% H-UCL (Log ROS)	1223		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.602	KM Geo Mean	4.963
KM SD (logged)	2.678	95% Critical H Value (KM-Log)	5.391
KM Standard Error of Mean (logged)	0.593	95% H-UCL (KM -Log)	4187
KM SD (logged)	2.678	95% Critical H Value (KM-Log)	5.391
KM Standard Error of Mean (logged)	0.593		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	68.35	Mean in Log Scale	1.556
SD in Original Scale	198.8	SD in Log Scale	2.8
95% t UCL (Assumes normality)	141.3	95% H-Stat UCL	7376

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	276

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Naphthalene

General Statistics

Total Number of Observations	19	Number of Distinct Observations	9
Number of Detects	4	Number of Non-Detects	15
Number of Distinct Detects	4	Number of Distinct Non-Detects	5
Minimum Detect	0.27	Minimum Non-Detect	0.8
Maximum Detect	3.2	Maximum Non-Detect	80
Variance Detects	1.473	Percent Non-Detects	78.95%
Mean Detects	1.593	SD Detects	1.214
Median Detects	1.45	CV Detects	0.762
Skewness Detects	0.677	Kurtosis Detects	1.471
Mean of Logged Detects	0.147	SD of Logged Detects	1.044

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.248	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.623	KM Standard Error of Mean	0.238
KM SD	0.798	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.035	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.014	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.336	95% KM Chebyshev UCL	1.66
97.5% KM Chebyshev UCL	2.108	99% KM Chebyshev UCL	2.99

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.275	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.662	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.251	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.716	k star (bias corrected MLE)	0.596
Theta hat (MLE)	0.928	Theta star (bias corrected MLE)	2.673
nu hat (MLE)	13.73	nu star (bias corrected)	4.766
Mean (detects)	1.593		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.544
Maximum	3.2	Median	0.267
SD	0.789	CV	1.451
k hat (MLE)	0.519	k star (bias corrected MLE)	0.472
Theta hat (MLE)	1.048	Theta star (bias corrected MLE)	1.152
nu hat (MLE)	19.72	nu star (bias corrected)	17.94
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (17.94, α)	9.346	Adjusted Chi Square Value (17.94, β)	8.806
95% Gamma Approximate UCL (use when n>=50)	1.044	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.623	SD (KM)	0.798
Variance (KM)	0.637	SE of Mean (KM)	0.238
k hat (KM)	0.609	k star (KM)	0.548
nu hat (KM)	23.14	nu star (KM)	20.82
theta hat (KM)	1.022	theta star (KM)	1.136
80% gamma percentile (KM)	1.026	90% gamma percentile (KM)	1.652
95% gamma percentile (KM)	2.315	99% gamma percentile (KM)	3.931

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (20.82, α)	11.46	Adjusted Chi Square Value (20.82, β)	10.85
95% Gamma Approximate KM-UCL (use when n>=50)	1.131	95% Gamma Adjusted KM-UCL (use when n<50)	1.194

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.294	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.597	Mean in Log Scale	-1.004
SD in Original Scale	0.745	SD in Log Scale	0.983
95% t UCL (assumes normality of ROS data)	0.894	95% Percentile Bootstrap UCL	0.915
95% BCA Bootstrap UCL	1.004	95% Bootstrap t UCL	1.212
95% H-UCL (Log ROS)	1.083		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.921	KM Geo Mean	0.398
KM SD (logged)	0.795	95% Critical H Value (KM-Log)	2.336
KM Standard Error of Mean (logged)	0.237	95% H-UCL (KM -Log)	0.846
KM SD (logged)	0.795	95% Critical H Value (KM-Log)	2.336
KM Standard Error of Mean (logged)	0.237		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4.146	Mean in Log Scale	0.0229
SD in Original Scale	9.504	SD in Log Scale	1.493
95% t UCL (Assumes normality)	7.927	95% H-Stat UCL	10.23

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.035

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1,2-Trichlorotrifluoroethane (Freon 113)

General Statistics

Total Number of Observations	19	Number of Distinct Observations	17
Number of Detects	14	Number of Non-Detects	5
Number of Distinct Detects	14	Number of Distinct Non-Detects	3
Minimum Detect	1	Minimum Non-Detect	0.4
Maximum Detect	180000	Maximum Non-Detect	1.1
Variance Detects	2.184E+9	Percent Non-Detects	26.32%
Mean Detects	23523	SD Detects	46730
Median Detects	7350	CV Detects	1.987
Skewness Detects	3.304	Kurtosis Detects	11.59
Mean of Logged Detects	7.882	SD of Logged Detects	3.403

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.523	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.315	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	17333	KM Standard Error of Mean	9527
KM SD	40018	95% KM (BCA) UCL	37642
95% KM (t) UCL	33853	95% KM (Percentile Bootstrap) UCL	35101
95% KM (z) UCL	33004	95% KM Bootstrap t UCL	68556
90% KM Chebyshev UCL	45914	95% KM Chebyshev UCL	58861
97.5% KM Chebyshev UCL	76830	99% KM Chebyshev UCL	112128

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.227	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.829	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.126	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.247	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.313	k star (bias corrected MLE)	0.294

Theta hat (MLE)	75043	Theta star (bias corrected MLE)	80034
nu hat (MLE)	8.777	nu star (bias corrected)	8.229
Mean (detects)	23523		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	17332
Maximum	180000	Median	2000
SD	41114	CV	2.372
k hat (MLE)	0.149	k star (bias corrected MLE)	0.161
Theta hat (MLE)	116355	Theta star (bias corrected MLE)	107971
nu hat (MLE)	5.661	nu star (bias corrected)	6.1
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (6.10, α)	1.691	Adjusted Chi Square Value (6.10, β)	1.497
95% Gamma Approximate UCL (use when n>=50)	62516	95% Gamma Adjusted UCL (use when n<50)	70615

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	17333	SD (KM)	40018
Variance (KM)	1.601E+9	SE of Mean (KM)	9527
k hat (KM)	0.188	k star (KM)	0.193
nu hat (KM)	7.129	nu star (KM)	7.336
theta hat (KM)	92394	theta star (KM)	89777
80% gamma percentile (KM)	22408	90% gamma percentile (KM)	52399
95% gamma percentile (KM)	90122	99% gamma percentile (KM)	194587

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.34, α)	2.357	Adjusted Chi Square Value (7.34, β)	2.118
95% Gamma Approximate KM-UCL (use when n>=50)	53949	95% Gamma Adjusted KM-UCL (use when n<50)	60044

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.864	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	17333	Mean in Log Scale	6
SD in Original Scale	41114	SD in Log Scale	4.371
95% t UCL (assumes normality of ROS data)	33689	95% Percentile Bootstrap UCL	34833
95% BCA Bootstrap UCL	44128	95% Bootstrap t UCL	66962
95% H-UCL (Log ROS)	3.794E+10		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	5.576	KM Geo Mean	264
KM SD (logged)	4.776	95% Critical H Value (KM-Log)	9.478

KM Standard Error of Mean (logged)	1.137	95% H-UCL (KM -Log)	1.023E+12
KM SD (logged)	4.776	95% Critical H Value (KM-Log)	9.478
KM Standard Error of Mean (logged)	1.137		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	17333	Mean in Log Scale	5.461
SD in Original Scale	41114	SD in Log Scale	5.072
95% t UCL (Assumes normality)	33689	95% H-Stat UCL	1.425E+13

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 60044

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1-Dichloroethane

General Statistics

Total Number of Observations	19	Number of Distinct Observations	9
Number of Detects	4	Number of Non-Detects	15
Number of Distinct Detects	4	Number of Distinct Non-Detects	5
Minimum Detect	0.37	Minimum Non-Detect	0.8
Maximum Detect	3.5	Maximum Non-Detect	80
Variance Detects	2.099	Percent Non-Detects	78.95%
Mean Detects	1.363	SD Detects	1.449
Median Detects	0.79	CV Detects	1.063
Skewness Detects	1.811	Kurtosis Detects	3.321
Mean of Logged Detects	-0.0716	SD of Logged Detects	0.972

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.784	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.349	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.712	KM Standard Error of Mean	0.237
KM SD	0.763	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.123	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.102	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.424	95% KM Chebyshev UCL	1.747
97.5% KM Chebyshev UCL	2.195	99% KM Chebyshev UCL	3.075

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.381	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.663	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.278	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.4	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.457	k star (bias corrected MLE)	0.531
Theta hat (MLE)	0.935	Theta star (bias corrected MLE)	2.566
nu hat (MLE)	11.66	nu star (bias corrected)	4.247
Mean (detects)	1.363		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.642
Maximum	3.5	Median	0.46
SD	0.781	CV	1.216
k hat (MLE)	0.752	k star (bias corrected MLE)	0.668
Theta hat (MLE)	0.854	Theta star (bias corrected MLE)	0.96
nu hat (MLE)	28.58	nu star (bias corrected)	25.4
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (25.40, α)	14.92	Adjusted Chi Square Value (25.40, β)	14.22
95% Gamma Approximate UCL (use when n>=50)	1.093	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.712	SD (KM)	0.763
Variance (KM)	0.582	SE of Mean (KM)	0.237
k hat (KM)	0.87	k star (KM)	0.768
nu hat (KM)	33.07	nu star (KM)	29.18
theta hat (KM)	0.818	theta star (KM)	0.927
80% gamma percentile (KM)	1.165	90% gamma percentile (KM)	1.748
95% gamma percentile (KM)	2.343	99% gamma percentile (KM)	3.753

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (29.18, α)	17.85	Adjusted Chi Square Value (29.18, β)	17.08
95% Gamma Approximate KM-UCL (use when n>=50)	1.163	95% Gamma Adjusted KM-UCL (use when n<50)	1.216

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.221	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.693	Mean in Log Scale	-0.63
SD in Original Scale	0.722	SD in Log Scale	0.673
95% t UCL (assumes normality of ROS data)	0.98	95% Percentile Bootstrap UCL	0.995
95% BCA Bootstrap UCL	1.124	95% Bootstrap t UCL	1.434
95% H-UCL (Log ROS)	0.946		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.583	KM Geo Mean	0.558
KM SD (logged)	0.567	95% Critical H Value (KM-Log)	2.075
KM Standard Error of Mean (logged)	0.224	95% H-UCL (KM -Log)	0.865
KM SD (logged)	0.567	95% Critical H Value (KM-Log)	2.075
KM Standard Error of Mean (logged)	0.224		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4.097	Mean in Log Scale	-0.0231
SD in Original Scale	9.523	SD in Log Scale	1.484
95% t UCL (Assumes normality)	7.886	95% H-Stat UCL	9.513

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 1.123

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics

Total Number of Observations	19	Number of Distinct Observations	7
Number of Detects	5	Number of Non-Detects	14
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	4.2	Minimum Non-Detect	0.8
Maximum Detect	79	Maximum Non-Detect	32
Variance Detects	909	Percent Non-Detects	73.68%
Mean Detects	34.04	SD Detects	30.15
Median Detects	29	CV Detects	0.886
Skewness Detects	0.823	Kurtosis Detects	-0.149
Mean of Logged Detects	3.084	SD of Logged Detects	1.174

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**

5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	9.685	KM Standard Error of Mean	5.187
KM SD	20.15	95% KM (BCA) UCL	19.26
95% KM (t) UCL	18.68	95% KM (Percentile Bootstrap) UCL	17.94
95% KM (z) UCL	18.22	95% KM Bootstrap t UCL	20.04
90% KM Chebyshev UCL	25.25	95% KM Chebyshev UCL	32.3
97.5% KM Chebyshev UCL	42.08	99% KM Chebyshev UCL	61.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.194	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.689	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.174	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.268	k star (bias corrected MLE)	0.641
Theta hat (MLE)	26.85	Theta star (bias corrected MLE)	53.14
nu hat (MLE)	12.68	nu star (bias corrected)	6.405
Mean (detects)	34.04		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	8.965
Maximum	79	Median	0.01
SD	20.95	CV	2.337
k hat (MLE)	0.16	k star (bias corrected MLE)	0.169
Theta hat (MLE)	56.2	Theta star (bias corrected MLE)	52.92
nu hat (MLE)	6.061	nu star (bias corrected)	6.438
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (6.44, α)	1.867	Adjusted Chi Square Value (6.44, β)	1.661
95% Gamma Approximate UCL (use when n>=50)	30.91	95% Gamma Adjusted UCL (use when n<50)	34.75

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9.685	SD (KM)	20.15
Variance (KM)	406.2	SE of Mean (KM)	5.187
k hat (KM)	0.231	k star (KM)	0.23
nu hat (KM)	8.775	nu star (KM)	8.723
theta hat (KM)	41.94	theta star (KM)	42.19
80% gamma percentile (KM)	13.61	90% gamma percentile (KM)	29.21
95% gamma percentile (KM)	48.06	99% gamma percentile (KM)	98.85

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.72, α)	3.16	Adjusted Chi Square Value (8.72, β)	2.874
95% Gamma Approximate KM-UCL (use when n>=50)	26.73	95% Gamma Adjusted KM-UCL (use when n<50)	29.39

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.195	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	9.652	Mean in Log Scale	0.201
SD in Original Scale	20.66	SD in Log Scale	2.25
95% t UCL (assumes normality of ROS data)	17.87	95% Percentile Bootstrap UCL	17.82
95% BCA Bootstrap UCL	21.45	95% Bootstrap t UCL	31.81
95% H-UCL (Log ROS)	185.9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.673	KM Geo Mean	1.96
KM SD (logged)	1.562	95% Critical H Value (KM-Log)	3.491
KM Standard Error of Mean (logged)	0.406	95% H-UCL (KM -Log)	23.99
KM SD (logged)	1.562	95% Critical H Value (KM-Log)	3.491
KM Standard Error of Mean (logged)	0.406		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	10.07	Mean in Log Scale	0.331
SD in Original Scale	20.76	SD in Log Scale	1.966
95% t UCL (Assumes normality)	18.33	95% H-Stat UCL	67.08

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 18.68

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chloroform

General Statistics

Total Number of Observations	19	Number of Distinct Observations	10
Number of Detects	6	Number of Non-Detects	13
Number of Distinct Detects	6	Number of Distinct Non-Detects	4
Minimum Detect	0.16	Minimum Non-Detect	0.28
Maximum Detect	21	Maximum Non-Detect	12

Variance Detects	67.07	Percent Non-Detects	68.42%
Mean Detects	4.383	SD Detects	8.19
Median Detects	1.305	CV Detects	1.868
Skewness Detects	2.384	Kurtosis Detects	5.747
Mean of Logged Detects	0.16	SD of Logged Detects	1.751

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.59	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.438	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.557	KM Standard Error of Mean	1.164
KM SD	4.625	95% KM (BCA) UCL	3.813
95% KM (t) UCL	3.576	95% KM (Percentile Bootstrap) UCL	3.715
95% KM (z) UCL	3.472	95% KM Bootstrap t UCL	12.74
90% KM Chebyshev UCL	5.049	95% KM Chebyshev UCL	6.631
97.5% KM Chebyshev UCL	8.827	99% KM Chebyshev UCL	13.14

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.556	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.306	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.349	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.484	k star (bias corrected MLE)	0.353
Theta hat (MLE)	9.049	Theta star (bias corrected MLE)	12.41
nu hat (MLE)	5.813	nu star (bias corrected)	4.24
Mean (detects)	4.383		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.391
Maximum	21	Median	0.01
SD	4.795	CV	3.447
k hat (MLE)	0.212	k star (bias corrected MLE)	0.214
Theta hat (MLE)	6.546	Theta star (bias corrected MLE)	6.499
nu hat (MLE)	8.075	nu star (bias corrected)	8.133
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (8.13, α)	2.812	Adjusted Chi Square Value (8.13, β)	2.546
95% Gamma Approximate UCL (use when n>=50)	4.023	95% Gamma Adjusted UCL (use when n<50)	4.444

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.557	SD (KM)	4.625
Variance (KM)	21.39	SE of Mean (KM)	1.164
k hat (KM)	0.113	k star (KM)	0.131
nu hat (KM)	4.306	nu star (KM)	4.959
theta hat (KM)	13.74	theta star (KM)	11.93
80% gamma percentile (KM)	1.493	90% gamma percentile (KM)	4.503
95% gamma percentile (KM)	8.78	99% gamma percentile (KM)	21.57

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.96, α)	1.133	Adjusted Chi Square Value (4.96, β)	0.984
95% Gamma Approximate KM-UCL (use when n>=50)	6.812	95% Gamma Adjusted KM-UCL (use when n<50)	7.843

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.193	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.534	Mean in Log Scale	-1.27
SD in Original Scale	4.755	SD in Log Scale	1.602
95% t UCL (assumes normality of ROS data)	3.426	95% Percentile Bootstrap UCL	3.662
95% BCA Bootstrap UCL	4.817	95% Bootstrap t UCL	14.17
95% H-UCL (Log ROS)	3.878		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.014	KM Geo Mean	0.363
KM SD (logged)	1.263	95% Critical H Value (KM-Log)	3.004
KM Standard Error of Mean (logged)	0.357	95% H-UCL (KM -Log)	1.969
KM SD (logged)	1.263	95% Critical H Value (KM-Log)	3.004
KM Standard Error of Mean (logged)	0.357		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.989	Mean in Log Scale	-0.742
SD in Original Scale	4.848	SD in Log Scale	1.481
95% t UCL (Assumes normality)	3.918	95% H-Stat UCL	4.595

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 7.843

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

cis-1,2-Dichloroethene

General Statistics

Total Number of Observations	19	Number of Distinct Observations	9
Number of Detects	5	Number of Non-Detects	14
Number of Distinct Detects	5	Number of Distinct Non-Detects	4
Minimum Detect	0.49	Minimum Non-Detect	0.4
Maximum Detect	57	Maximum Non-Detect	40
Variance Detects	591.2	Percent Non-Detects	73.68%
Mean Detects	14.01	SD Detects	24.32
Median Detects	2.1	CV Detects	1.735
Skewness Detects	2.114	Kurtosis Detects	4.512
Mean of Logged Detects	1.239	SD of Logged Detects	1.928

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.665	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.372	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.067	KM Standard Error of Mean	3.254
KM SD	12.66	95% KM (BCA) UCL	9.975
95% KM (t) UCL	9.71	95% KM (Percentile Bootstrap) UCL	9.912
95% KM (z) UCL	9.42	95% KM Bootstrap t UCL	73.54
90% KM Chebyshev UCL	13.83	95% KM Chebyshev UCL	18.25
97.5% KM Chebyshev UCL	24.39	99% KM Chebyshev UCL	36.45

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.426	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.717	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.277	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.373	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.459	k star (bias corrected MLE)	0.317
Theta hat (MLE)	30.5	Theta star (bias corrected MLE)	44.19
nu hat (MLE)	4.594	nu star (bias corrected)	3.171
Mean (detects)	14.01		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.695
Maximum	57	Median	0.01
SD	13.1	CV	3.545
k hat (MLE)	0.172	k star (bias corrected MLE)	0.18
Theta hat (MLE)	21.46	Theta star (bias corrected MLE)	20.52
nu hat (MLE)	6.542	nu star (bias corrected)	6.842
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (6.84, α)	2.084	Adjusted Chi Square Value (6.84, β)	1.863
95% Gamma Approximate UCL (use when n>=50)	12.13	95% Gamma Adjusted UCL (use when n<50)	13.57

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.067	SD (KM)	12.66
Variance (KM)	160.4	SE of Mean (KM)	3.254
k hat (KM)	0.103	k star (KM)	0.122
nu hat (KM)	3.919	nu star (KM)	4.634
theta hat (KM)	39.43	theta star (KM)	33.35
80% gamma percentile (KM)	3.632	90% gamma percentile (KM)	11.57
95% gamma percentile (KM)	23.16	99% gamma percentile (KM)	58.38

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.63, α)	0.987	Adjusted Chi Square Value (4.63, β)	0.851
95% Gamma Approximate KM-UCL (use when n>=50)	19.1	95% Gamma Adjusted KM-UCL (use when n<50)	22.14

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.941	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.202	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.713	Mean in Log Scale	-3.022
SD in Original Scale	13.09	SD in Log Scale	3.284
95% t UCL (assumes normality of ROS data)	8.921	95% Percentile Bootstrap UCL	9.527
95% BCA Bootstrap UCL	13.57	95% Bootstrap t UCL	97.48
95% H-UCL (Log ROS)	1779		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.3	KM Geo Mean	0.741
KM SD (logged)	1.314	95% Critical H Value (KM-Log)	3.085
KM Standard Error of Mean (logged)	0.347	95% H-UCL (KM -Log)	4.572
KM SD (logged)	1.314	95% Critical H Value (KM-Log)	3.085
KM Standard Error of Mean (logged)	0.347		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.487	Mean in Log Scale	-0.266
SD in Original Scale	13.45	SD in Log Scale	1.899
95% t UCL (Assumes normality)	10.84	95% H-Stat UCL	28.79

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 22.14

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Dichlorodifluoromethane

General Statistics

Total Number of Observations	19	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	13
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.33	Minimum Non-Detect	0.8
Maximum Detect	230	Maximum Non-Detect	80
Variance Detects	7623	Percent Non-Detects	68.42%
Mean Detects	86.99	SD Detects	87.31
Median Detects	74	CV Detects	1.004
Skewness Detects	0.828	Kurtosis Detects	0.148
Mean of Logged Detects	3.193	SD of Logged Detects	2.558

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.916	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	28.19	KM Standard Error of Mean	15.23
KM SD	60.31	95% KM (BCA) UCL	51.63
95% KM (t) UCL	54.59	95% KM (Percentile Bootstrap) UCL	52.62
95% KM (z) UCL	53.23	95% KM Bootstrap t UCL	65.71
90% KM Chebyshev UCL	73.87	95% KM Chebyshev UCL	94.56
97.5% KM Chebyshev UCL	123.3	99% KM Chebyshev UCL	179.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.408	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.294	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.349	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.499	k star (bias corrected MLE)	0.361

Theta hat (MLE)	174.3	Theta star (bias corrected MLE)	241.2
nu hat (MLE)	5.988	nu star (bias corrected)	4.328
Mean (detects)	86.99		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	28.55
Maximum	230	Median	0.01
SD	61.6	CV	2.157
k hat (MLE)	0.159	k star (bias corrected MLE)	0.169
Theta hat (MLE)	179.3	Theta star (bias corrected MLE)	168.8
nu hat (MLE)	6.052	nu star (bias corrected)	6.43
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (6.43, α)	1.863	Adjusted Chi Square Value (6.43, β)	1.657
95% Gamma Approximate UCL (use when n>=50)	98.53	95% Gamma Adjusted UCL (use when n<50)	110.8

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	28.19	SD (KM)	60.31
Variance (KM)	3637	SE of Mean (KM)	15.23
k hat (KM)	0.219	k star (KM)	0.219
nu hat (KM)	8.303	nu star (KM)	8.326
theta hat (KM)	129	theta star (KM)	128.7
80% gamma percentile (KM)	38.83	90% gamma percentile (KM)	85.18
95% gamma percentile (KM)	141.7	99% gamma percentile (KM)	295.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.33, α)	2.925	Adjusted Chi Square Value (8.33, β)	2.652
95% Gamma Approximate KM-UCL (use when n>=50)	80.24	95% Gamma Adjusted KM-UCL (use when n<50)	88.51

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.842	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.325	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data Not Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	28.21	Mean in Log Scale	0.258
SD in Original Scale	61.66	SD in Log Scale	2.921
95% t UCL (assumes normality of ROS data)	52.74	95% Percentile Bootstrap UCL	51.81
95% BCA Bootstrap UCL	60.2	95% Bootstrap t UCL	80.71
95% H-UCL (Log ROS)	5485		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.293	KM Geo Mean	1.341
KM SD (logged)	2.411	95% Critical H Value (KM-Log)	4.989

KM Standard Error of Mean (logged)	0.615	95% H-UCL (KM -Log)	417.3
KM SD (logged)	2.411	95% Critical H Value (KM-Log)	4.989
KM Standard Error of Mean (logged)	0.615		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	29.83	Mean in Log Scale	0.624
SD in Original Scale	61.56	SD in Log Scale	2.474
95% t UCL (Assumes normality)	54.32	95% H-Stat UCL	781.5

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 54.59

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Trichloroethene

General Statistics

Total Number of Observations	19	Number of Distinct Observations	10
Number of Detects	7	Number of Non-Detects	12
Number of Distinct Detects	6	Number of Distinct Non-Detects	4
Minimum Detect	0.17	Minimum Non-Detect	0.4
Maximum Detect	54	Maximum Non-Detect	40
Variance Detects	394.9	Percent Non-Detects	63.16%
Mean Detects	10.15	SD Detects	19.87
Median Detects	0.77	CV Detects	1.957
Skewness Detects	2.385	Kurtosis Detects	5.781
Mean of Logged Detects	0.522	SD of Logged Detects	2.091

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.597	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.372	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.993	KM Standard Error of Mean	3.026
KM SD	12.16	95% KM (BCA) UCL	10.06
95% KM (t) UCL	9.239	95% KM (Percentile Bootstrap) UCL	8.937
95% KM (z) UCL	8.969	95% KM Bootstrap t UCL	88.93
90% KM Chebyshev UCL	13.07	95% KM Chebyshev UCL	17.18
97.5% KM Chebyshev UCL	22.89	99% KM Chebyshev UCL	34.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.623	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.773	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.289	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.332	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.371	k star (bias corrected MLE)	0.307
Theta hat (MLE)	27.37	Theta star (bias corrected MLE)	33.05
nu hat (MLE)	5.193	nu star (bias corrected)	4.301
Mean (detects)	10.15		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.747
Maximum	54	Median	0.01
SD	12.53	CV	3.343
k hat (MLE)	0.185	k star (bias corrected MLE)	0.191
Theta hat (MLE)	20.3	Theta star (bias corrected MLE)	19.67
nu hat (MLE)	7.014	nu star (bias corrected)	7.239
Adjusted Level of Significance (β)	0.0369		
Approximate Chi Square Value (7.24, α)	2.303	Adjusted Chi Square Value (7.24, β)	2.067
95% Gamma Approximate UCL (use when n>=50)	11.78	95% Gamma Adjusted UCL (use when n<50)	13.12

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.993	SD (KM)	12.16
Variance (KM)	147.9	SE of Mean (KM)	3.026
k hat (KM)	0.108	k star (KM)	0.126
nu hat (KM)	4.095	nu star (KM)	4.782
theta hat (KM)	37.05	theta star (KM)	31.73
80% gamma percentile (KM)	3.689	90% gamma percentile (KM)	11.45
95% gamma percentile (KM)	22.64	99% gamma percentile (KM)	56.39

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.78, α)	1.053	Adjusted Chi Square Value (4.78, β)	0.911
95% Gamma Approximate KM-UCL (use when n>=50)	18.14	95% Gamma Adjusted KM-UCL (use when n<50)	20.96

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.217	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.899	Mean in Log Scale	-0.967
SD in Original Scale	12.48	SD in Log Scale	1.91
95% t UCL (assumes normality of ROS data)	8.863	95% Percentile Bootstrap UCL	8.969
95% BCA Bootstrap UCL	12.54	95% Bootstrap t UCL	96.58
95% H-UCL (Log ROS)	14.88		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.713	KM Geo Mean	0.49
KM SD (logged)	1.578	95% Critical H Value (KM-Log)	3.519
KM Standard Error of Mean (logged)	0.419	95% H-UCL (KM -Log)	6.312
KM SD (logged)	1.578	95% Critical H Value (KM-Log)	3.519
KM Standard Error of Mean (logged)	0.419		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.519	Mean in Log Scale	-0.23
SD in Original Scale	12.89	SD in Log Scale	1.91
95% t UCL (Assumes normality)	10.65	95% H-Stat UCL	31.05

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1) 20.96

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ATTACHMENT 3

ProUCL Output - Groundwater (RDX Plume Core), Trench/Culvert Scenario

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/21/2021 4:34:33 PM
From File	ProUCL Input_WBP Plume_CW.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4-Amino-2,6-dinitrotol0ene

General Statistics

Total Number of Observations	9	Number of Distinct Observations	5
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.11	Minimum Non-Detect	0.12
Maximum Detect	1.1	Maximum Non-Detect	0.12
Variance Detects	0.176	Percent Non-Detects	44.44%
Mean Detects	0.438	SD Detects	0.42
Median Detects	0.26	CV Detects	0.958
Skewness Detects	1.246	Kurtosis Detects	0.677
Mean of Logged Detects	-1.218	SD of Logged Detects	1.004

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.849	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.264	Lilliefors GOF Test
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.292	KM Standard Error of Mean	0.121
KM SD	0.324	95% KM (BCA) UCL	0.5
95% KM (t) UCL	0.517	95% KM (Percentile Bootstrap) UCL	0.478
95% KM (z) UCL	0.491	95% KM Bootstrap t UCL	1.066
90% KM Chebyshev UCL	0.654	95% KM Chebyshev UCL	0.818
97.5% KM Chebyshev UCL	1.046	99% KM Chebyshev UCL	1.493

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.346	Anderson-Darling GOF Test
5% A-D Critical Value	0.687	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.233	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.362	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.417	k star (bias corrected MLE)	0.7
Theta hat (MLE)	0.309	Theta star (bias corrected MLE)	0.625
nu hat (MLE)	14.17	nu star (bias corrected)	7.003
Mean (detects)	0.438		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.253
Maximum	1.1	Median	0.11
SD	0.369	CV	1.458
k hat (MLE)	0.544	k star (bias corrected MLE)	0.437
Theta hat (MLE)	0.465	Theta star (bias corrected MLE)	0.58
nu hat (MLE)	9.796	nu star (bias corrected)	7.864
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (7.86, α)	2.657	Adjusted Chi Square Value (7.86, β)	2.062
95% Gamma Approximate UCL (use when n>=50)	0.75	95% Gamma Adjusted UCL (use when n<50)	0.966

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.292	SD (KM)	0.324
Variance (KM)	0.105	SE of Mean (KM)	0.121
k hat (KM)	0.814	k star (KM)	0.617
nu hat (KM)	14.66	nu star (KM)	11.1
theta hat (KM)	0.359	theta star (KM)	0.474
80% gamma percentile (KM)	0.482	90% gamma percentile (KM)	0.755
95% gamma percentile (KM)	1.041	99% gamma percentile (KM)	1.731

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.10, α)	4.643	Adjusted Chi Square Value (11.10, β)	3.801
95% Gamma Approximate KM-UCL (use when n>=50)	0.699	95% Gamma Adjusted KM-UCL (use when n<50)	0.854

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.278	Mean in Log Scale	-1.859
SD in Original Scale	0.353	SD in Log Scale	1.097
95% t UCL (assumes normality of ROS data)	0.497	95% Percentile Bootstrap UCL	0.472
95% BCA Bootstrap UCL	0.559	95% Bootstrap t UCL	1.191
95% H-UCL (Log ROS)	1.088		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.658	KM Geo Mean	0.191
KM SD (logged)	0.831	95% Critical H Value (KM-Log)	2.875
KM Standard Error of Mean (logged)	0.31	95% H-UCL (KM -Log)	0.626
KM SD (logged)	0.831	95% Critical H Value (KM-Log)	2.875
KM Standard Error of Mean (logged)	0.31		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.27	Mean in Log Scale	-1.927
SD in Original Scale	0.357	SD in Log Scale	1.101
95% t UCL (Assumes normality)	0.492	95% H-Stat UCL	1.028

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.517

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

HMX

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	7	Number of Non-Detects	2
Number of Distinct Detects	7	Number of Distinct Non-Detects	2
Minimum Detect	2.6	Minimum Non-Detect	0.2
Maximum Detect	450	Maximum Non-Detect	0.21
Variance Detects	30007	Percent Non-Detects	22.22%
Mean Detects	169.9	SD Detects	173.2
Median Detects	91	CV Detects	1.019
Skewness Detects	0.969	Kurtosis Detects	-0.761
Mean of Logged Detects	4.366	SD of Logged Detects	1.732

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.851	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.247	Lilliefors GOF Test
5% Lilliefors Critical Value	0.304	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	132.2	KM Standard Error of Mean	56.91
KM SD	158.1	95% KM (BCA) UCL	226.4
95% KM (t) UCL	238	95% KM (Percentile Bootstrap) UCL	224.7
95% KM (z) UCL	225.8	95% KM Bootstrap t UCL	344.3
90% KM Chebyshev UCL	303	95% KM Chebyshev UCL	380.3
97.5% KM Chebyshev UCL	487.6	99% KM Chebyshev UCL	698.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.261	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.177	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.322	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.775	k star (bias corrected MLE)	0.538
Theta hat (MLE)	219.3	Theta star (bias corrected MLE)	315.8
nu hat (MLE)	10.85	nu star (bias corrected)	7.533
Mean (detects)	169.9		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	132.2
Maximum	450	Median	54
SD	167.7	CV	1.269
k hat (MLE)	0.278	k star (bias corrected MLE)	0.259
Theta hat (MLE)	475.5	Theta star (bias corrected MLE)	509.5
nu hat (MLE)	5.004	nu star (bias corrected)	4.669
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (4.67, α)	1.003	Adjusted Chi Square Value (4.67, β)	0.696
95% Gamma Approximate UCL (use when n>=50)	615.6	95% Gamma Adjusted UCL (use when n<50)	887.3

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	132.2	SD (KM)	158.1
Variance (KM)	24985	SE of Mean (KM)	56.91
k hat (KM)	0.7	k star (KM)	0.541
nu hat (KM)	12.6	nu star (KM)	9.73
theta hat (KM)	189	theta star (KM)	244.6
80% gamma percentile (KM)	217.7	90% gamma percentile (KM)	351.9
95% gamma percentile (KM)	494	99% gamma percentile (KM)	840.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.73, α)	3.774	Adjusted Chi Square Value (9.73, β)	3.033
95% Gamma Approximate KM-UCL (use when n>=50)	340.9	95% Gamma Adjusted KM-UCL (use when n<50)	424.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.875	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.262	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	132.5	Mean in Log Scale	3.5
SD in Original Scale	167.4	SD in Log Scale	2.282
95% t UCL (assumes normality of ROS data)	236.3	95% Percentile Bootstrap UCL	222.4
95% BCA Bootstrap UCL	246.4	95% Bootstrap t UCL	364.7
95% H-UCL (Log ROS)	80982		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.038	KM Geo Mean	20.87
KM SD (logged)	2.859	95% Critical H Value (KM-Log)	7.972
KM Standard Error of Mean (logged)	1.029	95% H-UCL (KM -Log)	3919752
KM SD (logged)	2.859	95% Critical H Value (KM-Log)	7.972
KM Standard Error of Mean (logged)	1.029		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	132.2	Mean in Log Scale	2.89
SD in Original Scale	167.7	SD in Log Scale	3.292
95% t UCL (Assumes normality)	236.1	95% H-Stat UCL	1.665E+8

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 238

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RDX

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	6	Number of Non-Detects	3
Number of Distinct Detects	6	Number of Distinct Non-Detects	3
Minimum Detect	12	Minimum Non-Detect	0.39
Maximum Detect	940	Maximum Non-Detect	0.41
Variance Detects	134037	Percent Non-Detects	33.33%
Mean Detects	198.8	SD Detects	366.1
Median Detects	43	CV Detects	1.841

Skewness Detects	2.363	Kurtosis Detects	5.646
Mean of Logged Detects	4.078	SD of Logged Detects	1.62

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.598	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.397	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	132.7	KM Standard Error of Mean	105.3
KM SD	288.5	95% KM (BCA) UCL	327.7
95% KM (t) UCL	328.6	95% KM (Percentile Bootstrap) UCL	326.5
95% KM (z) UCL	305.9	95% KM Bootstrap t UCL	1949
90% KM Chebyshev UCL	448.7	95% KM Chebyshev UCL	591.8
97.5% KM Chebyshev UCL	790.5	99% KM Chebyshev UCL	1181

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.605	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.288	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.348	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.52	k star (bias corrected MLE)	0.371
Theta hat (MLE)	382.5	Theta star (bias corrected MLE)	535.9
nu hat (MLE)	6.238	nu star (bias corrected)	4.452
Mean (detects)	198.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	132.6
Maximum	940	Median	15
SD	306	CV	2.309
k hat (MLE)	0.199	k star (bias corrected MLE)	0.207
Theta hat (MLE)	666.5	Theta star (bias corrected MLE)	641.4
nu hat (MLE)	3.58	nu star (bias corrected)	3.72
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.72, α)	0.614	Adjusted Chi Square Value (3.72, β)	0.403

95% Gamma Approximate UCL (use when n>=50)	802.7	95% Gamma Adjusted UCL (use when n<50)	1225

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	132.7	SD (KM)	288.5
Variance (KM)	83216	SE of Mean (KM)	105.3
k hat (KM)	0.212	k star (KM)	0.215
nu hat (KM)	3.808	nu star (KM)	3.872
theta hat (KM)	627.2	theta star (KM)	616.8
80% gamma percentile (KM)	181.2	90% gamma percentile (KM)	401.1
95% gamma percentile (KM)	670.5	99% gamma percentile (KM)	1404

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.87, α)	0.672	Adjusted Chi Square Value (3.87, β)	0.445
95% Gamma Approximate KM-UCL (use when n>=50)	764.7	95% Gamma Adjusted KM-UCL (use when n<50)	1155

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	132.8	Mean in Log Scale	2.667
SD in Original Scale	305.9	SD in Log Scale	2.473
95% t UCL (assumes normality of ROS data)	322.5	95% Percentile Bootstrap UCL	328.6
95% BCA Bootstrap UCL	426.6	95% Bootstrap t UCL	2120
95% H-UCL (Log ROS)	133818		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.405	KM Geo Mean	11.08
KM SD (logged)	2.656	95% Critical H Value (KM-Log)	7.435
KM Standard Error of Mean (logged)	0.97	95% H-UCL (KM -Log)	406590
KM SD (logged)	2.656	95% Critical H Value (KM-Log)	7.435
KM Standard Error of Mean (logged)	0.97		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	132.6	Mean in Log Scale	2.182
SD in Original Scale	306	SD in Log Scale	3.119
95% t UCL (Assumes normality)	322.3	95% H-Stat UCL	16229328

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	1949	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	1155

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1,2-Trichlorotrifl0oroethane (Freon 113)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	6	Number of Non-Detects	3
Number of Distinct Detects	6	Number of Distinct Non-Detects	3
Minimum Detect	6.1	Minimum Non-Detect	0.4
Maximum Detect	28000	Maximum Non-Detect	1.1
Variance Detects	1.123E+8	Percent Non-Detects	33.33%
Mean Detects	6869	SD Detects	10596
Median Detects	3300	CV Detects	1.542
Skewness Detects	2.207	Kurtosis Detects	5.058
Mean of Logged Detects	7.222	SD of Logged Detects	2.919

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.69	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.37	Lilliefors GOF Test
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4580	KM Standard Error of Mean	3117
KM SD	8536	95% KM (BCA) UCL	9990
95% KM (t) UCL	10375	95% KM (Percentile Bootstrap) UCL	9858
95% KM (z) UCL	9706	95% KM Bootstrap t UCL	23354
90% KM Chebyshev UCL	13930	95% KM Chebyshev UCL	18165
97.5% KM Chebyshev UCL	24044	99% KM Chebyshev UCL	35591

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.218	Anderson-Darling GOF Test
5% A-D Critical Value	0.75	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.166	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.352	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.407	k star (bias corrected MLE)	0.315
Theta hat (MLE)	16884	Theta star (bias corrected MLE)	21840
nu hat (MLE)	4.882	nu star (bias corrected)	3.774
Mean (detects)	6869		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4580
Maximum	28000	Median	710
SD	9053	CV	1.977
k hat (MLE)	0.149	k star (bias corrected MLE)	0.174
Theta hat (MLE)	30666	Theta star (bias corrected MLE)	26375
nu hat (MLE)	2.688	nu star (bias corrected)	3.125
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.13, α)	0.411	Adjusted Chi Square Value (3.13, β)	0.26
95% Gamma Approximate UCL (use when n>=50)	34866	95% Gamma Adjusted UCL (use when n<50)	54988

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4580	SD (KM)	8536
Variance (KM)	72856808	SE of Mean (KM)	3117
k hat (KM)	0.288	k star (KM)	0.266
nu hat (KM)	5.182	nu star (KM)	4.788
theta hat (KM)	15909	theta star (KM)	17218
80% gamma percentile (KM)	6791	90% gamma percentile (KM)	13678
95% gamma percentile (KM)	21756	99% gamma percentile (KM)	43078

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.79, α)	1.055	Adjusted Chi Square Value (4.79, β)	0.737
95% Gamma Approximate KM-UCL (use when n>=50)	20775	95% Gamma Adjusted KM-UCL (use when n<50)	29759

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.871	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.244	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4580	Mean in Log Scale	4.959
SD in Original Scale	9053	SD in Log Scale	4.104
95% t UCL (assumes normality of ROS data)	10192	95% Percentile Bootstrap UCL	10225
95% BCA Bootstrap UCL	11811	95% Bootstrap t UCL	26241
95% H-UCL (Log ROS)	8.669E+12		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.509	KM Geo Mean	90.84
KM SD (logged)	4.41	95% Critical H Value (KM-Log)	12.14
KM Standard Error of Mean (logged)	1.61	95% H-UCL (KM -Log)	2.516E+14
KM SD (logged)	4.41	95% Critical H Value (KM-Log)	12.14
KM Standard Error of Mean (logged)	1.61		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4580	Mean in Log Scale	4.441
SD in Original Scale	9053	SD in Log Scale	4.774
95% t UCL (Assumes normality)	10191	95% H-Stat UCL	3.113E+16

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	23354	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	29759

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Dichlorodifl0oromethane

General Statistics

Total Number of Observations	9	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.33	Minimum Non-Detect	0.8
Maximum Detect	230	Maximum Non-Detect	0.8
Variance Detects	9431	Percent Non-Detects	44.44%
Mean Detects	90.59	SD Detects	97.11
Median Detects	79	CV Detects	1.072
Skewness Detects	0.653	Kurtosis Detects	-0.87
Mean of Logged Detects	2.984	SD of Logged Detects	2.803

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.215	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	50.47	KM Standard Error of Mean	29.35
KM SD	78.76	95% KM (BCA) UCL	101.1
95% KM (t) UCL	105.1	95% KM (Percentile Bootstrap) UCL	94.37
95% KM (z) UCL	98.75	95% KM Bootstrap t UCL	126.6

90% KM Chebyshev UCL	138.5	95% KM Chebyshev UCL	178.4
97.5% KM Chebyshev UCL	233.8	99% KM Chebyshev UCL	342.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.365	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.266	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.375	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.428	k star (bias corrected MLE)	0.304
Theta hat (MLE)	211.8	Theta star (bias corrected MLE)	297.6
nu hat (MLE)	4.277	nu star (bias corrected)	3.044
Mean (detects)	90.59		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	50.33
Maximum	230	Median	0.33
SD	83.63	CV	1.662
k hat (MLE)	0.174	k star (bias corrected MLE)	0.19
Theta hat (MLE)	288.5	Theta star (bias corrected MLE)	264.4
nu hat (MLE)	3.141	nu star (bias corrected)	3.427
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.43, α)	0.509	Adjusted Chi Square Value (3.43, β)	0.328
95% Gamma Approximate UCL (use when n>=50)	338.6	95% Gamma Adjusted UCL (use when n<50)	525.9

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	50.47	SD (KM)	78.76
Variance (KM)	6203	SE of Mean (KM)	29.35
k hat (KM)	0.411	k star (KM)	0.348
nu hat (KM)	7.392	nu star (KM)	6.261
theta hat (KM)	122.9	theta star (KM)	145.1
80% gamma percentile (KM)	79.83	90% gamma percentile (KM)	145.9
95% gamma percentile (KM)	219.9	99% gamma percentile (KM)	409

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.26, α)	1.775	Adjusted Chi Square Value (6.26, β)	1.318
95% Gamma Approximate KM-UCL (use when n>=50)	178.1	95% Gamma Adjusted KM-UCL (use when n<50)	239.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.872	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.289	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	50.59	Mean in Log Scale	1.066
SD in Original Scale	83.46	SD in Log Scale	3.193
95% t UCL (assumes normality of ROS data)	102.3	95% Percentile Bootstrap UCL	97.91
95% BCA Bootstrap UCL	109.8	95% Bootstrap t UCL	181.8
95% H-UCL (Log ROS)	10545008		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.165	KM Geo Mean	3.207
KM SD (logged)	2.762	95% Critical H Value (KM-Log)	7.715
KM Standard Error of Mean (logged)	1.029	95% H-UCL (KM -Log)	271716
KM SD (logged)	2.762	95% Critical H Value (KM-Log)	7.715
KM Standard Error of Mean (logged)	1.029		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	50.5	Mean in Log Scale	1.251
SD in Original Scale	83.52	SD in Log Scale	2.856
95% t UCL (Assumes normality)	102.3	95% H-Stat UCL	639604

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	105.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ATTACHMENT 4

Non-detected Data Analysis: West Burn Pads Area

Chemicals that were 100 percent (%) non-detected (ND) in a data grouping were not identified as COPCs for that data grouping; however, a qualitative evaluation of the 100 % ND chemicals within the West Burn Pads (WBP) Area media was conducted. For this HHRA, the WBP media consisted of surface water, sediment and groundwater. However, no ND sediment chemicals had detection limits (DLs) or reporting limits (RLs) that were greater than screening levels (SLs), and as a result, the ND analysis was limited to surface water and groundwater data.

Surface water SLs are USEPA Regional Screening Levels (RSLs) for a recreational scenario calculated using an excess lifetime cancer risk (ELCR) of $1x10^{-6}$ and a hazard quotient (HQ) of 1 (USEPA, 2023). Groundwater SLs are the USEPA RSLs for tap water (USEPA, 2023) using an ELCR of $1x10^{-6}$ and a HQ of 1. The WBP ND chemicals and a comparison of the ND DLs and RLs to SLs is provided in Attachment 4 Table 1a (surface water) and Table 1b (groundwater). ND chemicals exceeding SLs are identified and discussed below with regard to the frequency of exceedance and potential to be related to former site activities.

Non-detected Chemicals Exceeding Screening Levels

Surface Water

In surface water, one metal (chromium) and one volatile organic compound ([VOC] 1,2,3-trichloropropane) have DLs and RLs greater than SLs. A data set of 2 samples each was available for chromium and 1,2,3-trichloropropane. Three explosives (DNX, MNX and TNX), one semi-volatile organic compound (SVOC; 1,3-dichlorobenzene) and 9 VOCs (1,3-dichlorobenzene, 1,1-dichloropropene, 1-chlorohexane, 2,2-dichloropropane, 4-isopropyltoluene, bromochloromethane, chloromethane, chloroethane, dibromomethane and methyl isobutyl ketone) were consistently ND in the WBP surface water data set, but SLs were not available for these ND chemicals. Therefore, those ND chemicals were not included in the ND assessment process.

Groundwater

In groundwater, 3 explosives (2,4-dinitrotoluene, 2-nitrotoluene and nitrobenzene), one metal (chromium), 3 ([SVOCs] 1,2,4-trichlorobenzene, 1,4-dichlorobenzene and hexachlorobutadiene), and 24 VOCs have RLs or DLs exceeding SLs at the WBP. Two ND explosives (2,4-dinitrotoluene and 2-nitrotoluene) and 3 ND VOCs (bromobenzene, bromochloromethane and chlorobenzene) had RLs that were greater than SLs but no DLs greater than SLs. ND analytes with DLs and/or RLs greater than SLs had a dataset of 29 samples per explosive, 8 samples for chromium, and 25 samples for SVOCs and VOCs. One SVOC (1,3-dichlorobenzene) and 2 VOCs (1,1-dichloropropene and 2,2-dichloropropane) were consistently ND in the WBP groundwater data set, but SLs were not available for these ND chemicals. Therefore, those ND chemicals were not included in the ND assessment process.

Non-detected Chemicals Related to Former Site Activities

To determine whether ND data exceeding SLs could potentially be related to former site activities, the historical IAAAP facility-wide dataset for the non-Formerly Utilized Sites Remedial Action Program (FUSRAP) sites was evaluated, and results are provided in Attachment 4 (Table 2). The ND comparison included historically detected chemicals in all media; however, sediment did not have any DLs or RLs greater than SLs at the WBP, and soil is being addressed under the Operable Unit 1 Remedial Action.

Surface Water

In surface water, one metal (chromium) and one VOC (1,2,3-trichloropropane) have DLs and RLs greater than SLs.

- **ND Metals in Surface Water:** Chromium has been historically detected in all media (groundwater, soil, surface water and sediment) at IAAAP. The maximum chromium DL of 8 ug/L and the maximum RL of 10 ug/L are less than the chromium Maximum Contaminant Level (MCL) of 100 ug/L (USEPA, 2023). Therefore, even if chromium was in surface water at quantities less than the maximum DL or maximum RL, chromium concentrations would be considered acceptable for potable use (although current and future use of site surface water is not designated for potable use).

- **ND VOCs in Surface Water**: 1,2,3-Trichloropropane has not been historically detected in any media (groundwater, soil, surface water or sediment) at IAAAP. Out of 60 ND VOCs in surface water, 1,2,3-trichloropropane was the only ND VOC with DLs and/or RLs greater than SLs. While there were 2 detected surface water VOCs (Freon 113 and 1,1-dichloroethene) in the surface water data set (see Attachment 1, Table 2.1), both VOCs were below SLs. Additionally, the 1,2,3-trichloropropane maximum DL of 0.8 ug/L and maximum RL or 3 ug/L are within acceptable levels for a VOC analysis. Of the 60 analyzed ND VOCs, 1,2,3-trichloropropane has the lowest SL (0.465 ug/L). As a result, the 1,2,3-trichloropropane DLs and RLs greater than SLs are most likely due to the higher toxicity/lower SL associated with 1,2,3-trichloropropane in comparison to the other analyzed VOCs, and it is highly probable 1,2,3-trichloropropane is not present in site groundwater.

Groundwater

In groundwater, 3 explosives (2,4-dinitrotoluene, 2-nitrotoluene and nitrobenzene), one metal (chromium), 3 SVOCs (1,2,4-trichlorobenzene, 1,4-dichlorobenzene and hexachlorobutadiene), and 24 VOCs have RLs and/or DLs exceeding SLs at the WBP.

- **ND Explosives in Groundwater**: 2,4-dinitrotoluene, 2-nitrotoluene and nitrobenzene have been historically detected in groundwater, soil and surface water at IAAAP, but of the 3 explosives, only 2,4-dinitrotoluene and nitrobenzene have been historically detected in sediment at IAAAP. It is noted that DLs (ranging from 0.082 to 0.21 ug/L) and RLs (ranging from 0.1 to 0.42 ug/L) for the 3 explosives with RLs and 1 explosive with DLs greater than SLs are acceptably low for an explosives analysis. Additionally, when compared to the other ND explosives with DLs and RLs less than SLs, the SLs for the 3 ND explosives with DLs and/or RLs greater than SLs also have the lowest SLs for all the ND explosives. As a result, despite having acceptably low DLs and RLs for explosives analysis, it is highly probable that the ND explosives with DLs and RLs greater than SLs are due to the relatively higher toxicity of these 3 explosives in comparison to the other analyzed ND explosives, and it is unlikely any of the ND explosives are present in site groundwater.
- **ND Metals in Groundwater:** Chromium has been historically detected in all media (groundwater, soil, surface water and sediment) at IAAAP. The maximum chromium DL of 8 ug/L and the maximum RL of 10 ug/L are less than the chromium MCL of 100 ug/L (USEPA, 2023). Therefore, even if chromium was in site groundwater at quantities less than the maximum DL or maximum RL, it would not be identified as a chemical of concern (COC) in groundwater.

- **ND SVOCs in Groundwater**: 1,2,4-Trichlorobenzene, 1,4-dichlorobenzene and hexachlorobutadiene have all been historically detected in soil at IAAAP, but only 1,2,4-trichlorobenzene has been historically detected in groundwater at IAAAP, and none of the 3 ND

SVOCs have been historically detected in surface water or sediment at IAAAP. The maximum DLs for 1,2,4-trichlorobenzene, 1,4-dichlorobenzene and hexachlorobenzene are 80 ug/L, 40 ug/L and 80 ug/L, respectively, and the maximum RLs are 100 ug/L. However, it is noted that for 1,2,4-trichlorobenzene and hexachlorobutadiene, 21 of 25 samples (84%) have a DL of 0.8 ug/L and a RL of 1 ug/L and that for 1,4-dichlorobenzene, 21 of 25 samples (84%) have a DL of 0.4 ug/L and a RL of 1 ug/L. The elevated DLs and RLs for all three ND SVOCs with RLs and/or DLs greater than SLs came from samples WBP-99-2-0319, WBP-TTMW-01-0319, WBP-TTMW-02-0319 and WBP-TTMW-14-0319 (see Attachment 2 [WBP Analytical Data]). It is noted that the locations (WBP-99-2 and WBP-TTMW-01) associated with ND SVOC samples with elevated DLs and RLs are also associated with relatively elevated VOC detections (See Attachment 1, Table 2.3 and Attachment 2). The elevated ND SVOC RLs and DLs are likely the result of chemical interferences from the elevated detected VOC concentrations in WBP-99-2 and WBP-TTMW-01; and as demonstrated by 84% of ND SVOCs with RLs less than 1 ug/L, it is highly unlikely any of the ND SVOCs with RLs and/or DLs greater than SLs are present in site groundwater.

- **ND VOCs in Groundwater**: Twenty-four of the ND VOCs had RLs greater than SLs, and 21 of the ND VOCs had DLs greater than SLs. Of the 24 ND VOCs with DLs and/or RLs greater than SLs, 13 have been historically detected in groundwater at IAAAP, 5 have been historically detected in soil at IAAAP, 7 have been historically detected in surface water at IAAAP, and 2 have been historically detected in sediment at IAAAP. There are 600 analytical results for the combined 24 ND VOCs with DLs and/or RLs greater than SLs (see Attachment 2). The DLs for these 24 ND VOCs range from 0.2 ug/L to 400 ug/L and RLs range from 1 ug/L to 500 ug/L. However, 504 of the 600 analytical results (84%) of the combined 24 ND VOCs with DLs and/or RLs greater than SLs have RLs equal to or less than 5 ug/L and 520 of the 600 analytical results (87%) have DLs of 4 ug/L or less. Additionally, the sample locations with RLs greater than 100 ug/L that are associated with the 24 ND VOCs come from sample locations WBP-99-2, WBP-TTMW-01 and WBP-TTMW-02, which are within the defined boundaries of the WBP VOC plumes and which have confirmed elevated detections of plume-associated VOCs. The elevated ND VOC RLs and DLs are likely the result of chemical interferences from the elevated detected VOC concentrations at WBP-99-2 and WBP-TTMW-01 and WBP-TTMW-02, and as demonstrated by 84% of ND SVOCs with RLs equal to or less than 5 ug/L and 87% of DLs equal to or less than 4 ug/L, it is highly unlikely any of the ND VOCs with RLs and/or DLs greater than SLs are present in site groundwater.

Conclusions

In surface water, one metal (chromium) and one VOC (1,2,3-trichloropropane) have DLs and/or RLs greater than SLs. In groundwater, 3 explosives (2,4-dinitrotoluene, 2-nitrotoluene and nitrobenzene), one metal (chromium), 3 SVOCs (1,2,4-trichlorobenzene, 1,4-dichlorobenzene and hexachlorobutadiene), and 24 VOCs have RLs and/or DLs exceeding SLs at the WBP. Although the DLs and/or RLs for these ND chemicals are greater than the SLs, based on the frequency of exceedance, probable chemical interference from detected VOCs and comparison to historically detected chemicals in groundwater at IAAAP, further consideration of ND chemicals does not appear warranted in the WBP HHRA.

References

USEPA. 2023. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* May.

ATTACHMENT 4, TABLE 1a: SURFACE WATER
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
Explosives	99-35-4	1,3,5-Trinitrobenzene	ug/L	0 / 6	0.19	0.43	1	1.1	287000	0	0
Explosives	99-65-0	1,3-Dinitrobenzene	ug/L	0 / 6	0.19	0.22	0.4	0.43	681	0	0
Explosives	118-96-7	2,4,6-Trinitrotoluene	ug/L	0 / 6	0.19	0.43	0.4	0.43	3790	0	0
Explosives	121-14-2	2,4-Dinitrotoluene	ug/L	0 / 6	0.19	0.22	0.4	0.43	92.2	0	0
Explosives	606-20-2	2,6-Dinitrotoluene	ug/L	0 / 6	0.19	0.22	0.2	0.22	16.7	0	0
Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	ug/L	0 / 6	0.12	0.19	0.2	0.22	557	0	0
Explosives	88-72-2	2-Nitrotoluene	ug/L	0 / 6	0.19	0.22	0.4	0.43	68.7	0	0
Explosives	99-08-1	3-Nitrotoluene	ug/L	0 / 6	0.19	0.43	0.4	0.43	197	0	0
Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	ug/L	0 / 6	0.12	0.19	0.2	0.22	557	0	0
Explosives	99-99-0	4-Nitrotoluene	ug/L	0 / 6	0.19	0.43	1	1.1	864	0	0
Explosives	DNX	DNX	ug/L	0 / 6	0.19	0.27	0.5	0.54	--	--	--
Explosives	5755-27-1	MNX	ug/L	0 / 6	0.19	0.31	0.5	0.54	--	--	--
Explosives	98-95-3	Nitrobenzene	ug/L	0 / 6	0.19	0.22	0.4	0.43	7530	0	0
Explosives	479-45-8	Tetryl	ug/L	0 / 6	0.19	0.22	0.24	0.26	17500	0	0
Explosives	13980-04-6	TNX	ug/L	0 / 6	0.19	0.27	0.5	0.54	--	--	--
Metals	7440-36-0	Antimony	ug/L	0 / 2	4	4	5	5	1740	0	0
Metals	7440-38-2	Arsenic	ug/L	0 / 2	8	8	10	10	45.9	0	0
Metals	7440-41-7	Beryllium	ug/L	0 / 2	0.4	0.4	0.5	0.5	564	0	0
Metals	7440-43-9	Cadmium	ug/L	0 / 2	0.4	0.4	0.5	0.5	180	0	0
Metals	7440-47-3	Chromium	ug/L	0 / 2	8	8	10	10	2.9	2	2
Metals	7440-48-4	Cobalt	ug/L	0 / 2	1.8	1.8	2	2	3880	0	0
Metals	7439-92-1	Lead	ug/L	0 / 2	2	2	3	3	15	0	0
Metals	7439-97-6	Mercury	ug/L	0 / 2	0.15	0.15	0.2	0.2	--	0	0
Metals	7439-98-7_D	Molybdenum, Dissolved	ug/L	0 / 2	4	4	5	5	54400	0	0
Metals	7782-49-2	Selenium	ug/L	0 / 2	4	4	5	5	54400	0	0
Metals	7440-22-4	Silver	ug/L	0 / 2	1.8	1.8	2	2	11600	0	0
Metals	7440-28-0	Thallium	ug/L	0 / 2	1.8	1.8	2	2	109	0	0
Metals	7440-66-6	Zinc	ug/L	0 / 2	15	15	20	20	3650000	0	0
PAHs	91-20-3	Naphthalene	ug/L	0 / 2	0.8	0.8	1	1	30	0	0
SVOCs	120-82-1	1,2,4-Trichlorobenzene	ug/L	0 / 2	0.8	0.8	1	1	61	0	0
SVOCs	95-50-1	1,2-Dichlorobenzene	ug/L	0 / 2	0.4	0.4	1	1	47900	0	0
SVOCs	541-73-1	1,3-Dichlorobenzene	ug/L	0 / 2	0.4	0.4	1	1	--	--	--
SVOCs	106-46-7	1,4-Dichlorobenzene	ug/L	0 / 2	0.4	0.4	1	1	614	0	0
SVOCs	87-68-3	Hexachlorobutadiene	ug/L	0 / 2	0.8	0.8	1	1	13.3	0	0
VOCs	630-20-6	1,1,1,2-Tetrachloroethane	ug/L	0 / 2	0.8	0.8	1	1	307	0	0
VOCs	71-55-6	1,1,1-Trichloroethane	ug/L	0 / 5	0.4	1	1	1	3650000	0	0
VOCs	79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0 / 5	0.8	1	1	1	82.4	0	0
VOCs	79-00-5	1,1,2-Trichloroethane	ug/L	0 / 5	0.8	1	1	1	425	0	0
VOCs	75-34-3	1,1-Dichloroethane	ug/L	0 / 5	0.8	1	1	1	3810	0	0
VOCs	563-58-6	1,1-Dichloropropene	ug/L	0 / 2	0.4	0.4	1	1	--	--	--
VOCs	87-61-6	1,2,3-Trichlorobenzene	ug/L	0 / 2	0.8	0.8	1	1	214	0	0
VOCs	96-18-4	1,2,3-Trichloropropane	ug/L	0 / 2	0.8	0.8	3	3	0.257	2	2
VOCs	95-63-6	1,2,4-Trimethylbenzene	ug/L	0 / 2	0.4	0.4	1	1	3360	0	0
VOCs	96-12-8	1,2-Dibromo-3-chloropropane	ug/L	0 / 2	1.6	1.6	5	5	6.6	0	0
VOCs	106-93-4	1,2-Dibromoethane	ug/L	0 / 2	0.4	0.4	1	1	14.9	0	0
VOCs	107-06-2	1,2-Dichloroethane	ug/L	0 / 5	0.4	1	1	1	335	0	0
VOCs	78-87-5	1,2-Dichloropropane	ug/L	0 / 5	0.4	1	1	1	517	0	0
VOCs	108-67-8	1,3,5-Trimethylbenzene	ug/L	0 / 2	0.4	0.4	1	1	4540	0	0
VOCs	142-28-9	1,3-Dichloropropane	ug/L	0 / 2	0.2	0.2	1	1	59100	0	0
VOCs	544-10-5	1-Chlorohexane	ug/L	0 / 2	0.4	0.4	1	1	--	--	--
VOCs	594-20-7	2,2-Dichloropropane	ug/L	0 / 2	0.8	0.8	1	1	--	--	--
VOCs	95-49-8	2-Chlorotoluene	ug/L	0 / 2	0.4	0.4	1	1	9480	0	0
VOCs	591-78-6	2-Hexanone	ug/L	0 / 5	4	10	5	5	26800	0	0
VOCs	99-87-6	4-Isopropyltoluene	ug/L	0 / 2	0.4	0.4	1	1	--	--	--
VOCs	67-64-1	Acetone	ug/L	0 / 5	6.4	25	10	10	10900000	0	0
VOCs	71-43-2	Benzene	ug/L	0 / 5	0.4	1	1	1	220	0	0

ATTACHMENT 4, TABLE 1a: SURFACE WATER
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
VOCs	108-86-1	Bromobenzene	ug/L	0 / 2	0.4	0.4	1	1	8550	0	0
VOCs	74-97-5	Bromochloromethane	ug/L	0 / 2	0.2	0.2	1	1	--	--	--
VOCs	75-27-4	Bromodichloromethane	ug/L	0 / 5	0.4	1	1	1	415	0	0
VOCs	75-25-2	Bromoform	ug/L	0 / 5	1	1	1	1	3170	0	0
VOCs	74-83-9	Bromomethane	ug/L	0 / 5	0.8	2	2	2	8700	0	0
VOCs	75-15-0	Carbon disulfide	ug/L	0 / 5	0.8	2	2	2	241000	0	0
VOCs	56-23-5	Carbon tetrachloride	ug/L	0 / 5	0.4	1	2	2	118	0	0
VOCs	74-87-3	Chloro methane	ug/L	0 / 5	0.8	2	2	2	--	--	--
VOCs	108-90-7	Chlorobenzene	ug/L	0 / 5	0.4	1	1	1	19500	0	0
VOCs	75-00-3	Chloroethane	ug/L	0 / 5	1.6	2	2	2	--	--	--
VOCs	67-66-3	Chloroform	ug/L	0 / 5	0.4	1	1	1	652	0	0
VOCs	156-59-2	cis-1,2-Dichloroethene	ug/L	0 / 5	0.4	1	1	1	4690	0	0
VOCs	10061-01-5	cis-1,3-Dichloropropene	ug/L	0 / 5	0.4	1	1	1	177	0	0
VOCs	124-48-1	Dibromochloromethane	ug/L	0 / 5	0.4	1	1	1	316	0	0
VOCs	74-95-3	Dibromomethane	ug/L	0 / 2	0.4	0.4	1	1	--	--	--
VOCs	75-71-8	Dichlorodifluoromethane	ug/L	0 / 2	0.8	0.8	2	2	512000	0	0
VOCs	100-41-4	Ethyl- benzene	ug/L	0 / 5	0.4	1	1	1	346	0	0
VOCs	98-82-8	Isopropylbenzene	ug/L	0 / 2	0.4	0.4	1	1	32100	0	0
VOCs	78-93-3	Methyl ethyl ketone	ug/L	0 / 5	4	5	6	6	6180000	0	0
VOCs	108-10-1	Methyl isobutyl ketone	ug/L	0 / 5	3.2	5	5	5	--	--	--
VOCs	1634-04-4	Methyl tert-butyl ether (MTBE)	ug/L	0 / 2	0.8	0.8	5	5	25900	0	0
VOCs	75-09-2	Methylene chloride	ug/L	0 / 5	2	5	5	5	33300	0	0
VOCs	104-51-8	N-Butylbenzene	ug/L	0 / 2	0.8	0.8	1	1	740000	0	0
VOCs	103-65-1	N-Propylbenzene	ug/L	0 / 2	0.4	0.4	1	1	30800	0	0
VOCs	106-43-4	p-Chlorotoluene	ug/L	0 / 2	0.8	0.8	1	1	10800	0	0
VOCs	135-98-8	sec-Butylbenzene	ug/L	0 / 2	0.4	0.4	1	1	1480000	0	0
VOCs	100-42-5	Styrene	ug/L	0 / 5	0.8	1	1	1	157000	0	0
VOCs	98-06-6	tert-Butylbenzene	ug/L	0 / 2	0.4	0.4	1	1	18100	0	0
VOCs	127-18-4	Tetrachloroethene	ug/L	0 / 5	0.4	1	1	1	3830	0	0
VOCs	108-88-3	Toluene	ug/L	0 / 5	0.4	1	1	1	77100	0	0
VOCs	156-60-5	trans-1,2-Dichloroethene	ug/L	0 / 5	0.4	1	1	1	46900	0	0
VOCs	10061-02-6	trans-1,3-Dichloropropene	ug/L	0 / 5	0.4	1	1	1	177	0	0
VOCs	79-01-6	Trichloroethene	ug/L	0 / 5	0.4	1	1	1	988	0	0
VOCs	75-69-4	Trichlorofluoromethane (Freon 11)	ug/L	0 / 2	0.8	0.8	2	2	534000	0	0
VOCs	75-01-4	Vinyl chloride	ug/L	0 / 5	0.2	1	1.5	1.5	27.8	0	0
VOCs	XYLMP	Xylene, m,p-	ug/L	0 / 2	0.8	0.8	2	2	119000	0	0
VOCs	95-47-6	Xylene, o-	ug/L	0 / 2	0.4	0.4	1	1	126000	0	0
VOCs	1330-20-7	Xylenes, total	ug/L	0 / 3	3	3	-	-	119000	0	0

Notes:
(1) Calculated Recerational Scenario Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2023) - Surface Water. Concentrations based on non-carcinogenic health effects are based on HQ=1; carcinogenic effects are based on risk of 1E-06. Available: https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
1,3-Dichloropropene was used as a surrogate for cis-1,3-Dichloropropene
1,3-Dichloropropene was used as a surrogate for trans-1,3-Dichloropropene
Total Xylene was used as a surrogate for Xylene, m,p-
[2] The maximum detection limit and reporting limit were compared to the screening level.

FOD = frequency of detect
ug/L = microgram per liter
NA = not available

ATTACHMENT 4, TABLE 1b: GROUNDWATER
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
Explosives	118-96-7	2,4,6-Trinitrotoluene	ug/L	0 / 29	0.1	0.42	0.11	0.42	2.5	0	0
Explosives	121-14-2	2,4-Dinitrotoluene	ug/L	0 / 29	0.082	0.21	0.1	0.42	0.24	0	28
Explosives	88-72-2	2-Nitrotoluene	ug/L	0 / 29	0.19	0.21	0.22	0.42	0.31	0	28
Explosives	99-08-1	3-Nitrotoluene	ug/L	0 / 29	0.39	0.42	0.39	0.42	1.7	0	0
Explosives	99-99-0	4-Nitrotoluene	ug/L	0 / 29	0.39	0.42	0.42	1.1	4.3	0	0
Explosives	98-95-3	Nitrobenzene	ug/L	0 / 29	0.19	0.21	0.22	0.42	0.14	29	29
Metals	7440-47-3	Chromium	ug/L	0 / 8	8	8	10	10	0.035	8	8
Metals	7439-97-6	Mercury	ug/L	0 / 8	0.15	0.15	0.2	0.2	0.63	0	0
Metals	7440-22-4	Silver	ug/L	0 / 8	1.8	1.8	2	2	94	0	0
SVOCs	120-82-1	1,2,4-Trichlorobenzene	ug/L	0 / 25	0.8	80	1	100	1.2	4	4
SVOCs	95-50-1	1,2-Dichlorobenzene	ug/L	0 / 25	0.4	40	1	100	300	0	0
SVOCs	541-73-1	1,3-Dichlorobenzene	ug/L	0 / 25	0.4	40	1	100	--	--	--
SVOCs	106-46-7	1,4-Dichlorobenzene	ug/L	0 / 25	0.4	40	1	100	0.48	4	25
SVOCs	87-68-3	Hexachlorobutadiene	ug/L	0 / 25	0.8	80	1	100	0.14	25	25
VOCs	630-20-6	1,1,1,2-Tetrachloroethane	ug/L	0 / 25	0.8	80	1	100	0.57	25	25
VOCs	79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0 / 25	0.8	80	1	100	0.076	25	25
VOCs	79-00-5	1,1,2-Trichloroethane	ug/L	0 / 25	0.8	80	1	100	0.28	25	25
VOCs	563-58-6	1,1-Dichloropropene	ug/L	0 / 25	0.4	40	1	100	--	--	--
VOCs	87-61-6	1,2,3-Trichlorobenzene	ug/L	0 / 25	0.8	80	1	100	7	4	4
VOCs	96-18-4	1,2,3-Trichloropropane	ug/L	0 / 25	0.8	80	3	300	0.00075	25	25
VOCs	96-12-8	1,2-Dibromo-3-chloropropane	ug/L	0 / 25	1.6	160	5	500	0.00033	25	25
VOCs	106-93-4	1,2-Dibromoethane	ug/L	0 / 25	0.4	40	1	100	0.0075	25	25
VOCs	107-06-2	1,2-Dichloroethane	ug/L	0 / 25	0.4	40	1	100	0.17	25	25
VOCs	78-87-5	1,2-Dichloropropane	ug/L	0 / 25	0.4	40	1	100	0.85	4	25
VOCs	142-28-9	1,3-Dichloropropane	ug/L	0 / 25	0.2	20	1	100	370	0	0
VOCs	594-20-7	2,2-Dichloropropane	ug/L	0 / 25	0.8	80	1	100	--	--	--
VOCs	95-49-8	2-Chlorotoluene	ug/L	0 / 25	0.4	40	1	100	240	0	0
VOCs	591-78-6	2-Hexanone	ug/L	0 / 25	4	400	5	500	38	4	4
VOCs	108-86-1	Bromobenzene	ug/L	0 / 25	0.4	40	1	100	62	0	1
VOCs	74-97-5	Bromochloromethane	ug/L	0 / 25	0.2	20	1	100	83	0	1
VOCs	75-27-4	Bromodichloromethane	ug/L	0 / 25	0.4	40	1	100	0.13	25	25
VOCs	75-25-2	Bromoform	ug/L	0 / 25	1	100	1	100	3.3	4	4
VOCs	56-23-5	Carbon tetrachloride	ug/L	0 / 25	0.4	40	2	200	0.46	4	25
VOCs	108-90-7	Chlorobenzene	ug/L	0 / 25	0.4	40	1	100	78	0	1
VOCs	75-00-3	Chloroethane	ug/L	0 / 25	1.6	160	2	200	8300	0	0
VOCs	10061-01-5	cis-1,3-Dichloropropene	ug/L	0 / 25	0.4	40	1	100	0.47	4	25
VOCs	124-48-1	Dibromochloromethane	ug/L	0 / 25	0.4	40	1	100	0.87	4	25
VOCs	74-95-3	Dibromomethane	ug/L	0 / 25	0.4	40	1	100	8.3	2	4
VOCs	108-10-1	Methyl isobutyl ketone	ug/L	0 / 25	3.2	320	5	500	6300	0	0
VOCs	1634-04-4	Methyl tert-butyl ether (MTBE)	ug/L	0 / 25	0.8	80	5	500	14	3	4
VOCs	75-09-2	Methylene chloride	ug/L	0 / 25	2	200	5	500	11	4	4
VOCs	106-43-4	p-Chlorotoluene	ug/L	0 / 25	0.8	80	1	100	250	0	0
VOCs	100-42-5	Styrene	ug/L	0 / 25	0.8	80	1	100	1200	0	0
VOCs	98-06-6	tert-Butylbenzene	ug/L	0 / 25	0.4	40	1	100	690	0	0
VOCs	127-18-4	Tetrachloroethene	ug/L	0 / 25	0.4	40	1	100	11	2	3
VOCs	10061-02-6	trans-1,3-Dichloropropene	ug/L	0 / 25	0.4	40	1	100	0.47	4	25
VOCs	75-69-4	Trichlorofluoromethane (Freon 11)	ug/L	0 / 25	0.8	80	2	200	5200	0	0
VOCs	75-01-4	Vinyl chloride	ug/L	0 / 25	0.2	20	1.5	150	0.019	25	25

Notes:
(1) Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2023) - Tapwater. Concentrations based on non-carcinogenic health effects are based on HQ=1; carcinogenic effects are based on risk of 1E-06. Available: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
1,3-Dichloropropene was used as a surrogate for cis-1,3-Dichloropropene
1,3-Dichloropropene was used as a surrogate for trans-1,3-Dichloropropene
[2] The maximum detection limit and reporting limit were compared to the screening level.

FOD = frequency of detect
ug/L = microgram per liter
NA = not available

ATTACHMENT 4, TABLE 2

Historically Detected Chemicals at IAAAP

Iowa Army Ammunition Plant, West Burn Pads Area, Middletown, Iowa

100% ND Chemical > SL	Detected in Groundwater	Detected in soil	Detected in Surface Water	Detected in Sediment
2,4-Dinitrotoluene	X	X	X	X
2-Nitrotoluene	X	X	X	--
Nitrobenzene	X	X	X	X
Chromium	X	X	X	X
1,2,4-Trichlorobenzene	X	X	--	--
1,4-Dichlorobenzene	--	X	--	--
Hexachlorobutadiene	--	X	--	--
1,1,1,2-Tetrachloroethane	--	--	--	--
1,1,2,2-Tetrachloroethane	X	X	--	X
1,1,2-Trichloroethane	X	--	--	--
1,2,3-Trichlorobenzene	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--
1,2-Dibromo-3-chloropropane	--	--	--	--
1,2-Dibromoethane	--	--	--	--
1,2-Dichloroethane	X	--	X	--
1,2-Dichloropropane	X	X	--	--
2-Hexanone	--	--	--	--
Bromobenzene	--	--	--	--
Bromochloromethane	X	--	--	--
Bromodichloromethane	X	--	X	--
Bromoform	--	--	--	--
Carbon tetrachloride	X	--	X	--
Chlorobenzene	X	X	X	--
cis-1,3-Dichloropropene	--	--	--	--
Dibromochloromethane	X	--	X	--
Dibromomethane	--	--	--	--
Methyl tert-butyl ether (MTBE)	X	--	--	--
Methylene chloride	X	X	X	--
Tetrachloroethene	X	X	--	X
trans-1,3-Dichloropropene	--	--	--	--
Vinyl chloride	X	--	X	--

X = chemical was historically detected

-- = chemical was not historically detected.

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Soil	Soil	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion, Inhalation	On-site	None	The North Burn Pads is closed to recreational use; therefore, hunting is not permitted at the site. Additionally, soil is addressed under OU1 with land use controls for industrial land use.
	Surface Water/Sediment	Surface Water/Sediment	Spring Creek	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion	On-site	None(1)	There is a very small reach of an unnamed perennial surface water feature within the NBP site boundary. Since it flows into the WBP Area, surface water and sediment are evaluated in the WBP Area HHRA.
Future	Soil	Soil	Soil	Site Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	Soil is addressed under OU1 with land use controls for industrial land use.
				Construction/ Utility Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	
				Hypothetical Resident	Adult, Child	Dermal, Ingestion, Inhalation	On-site	None	
	Groundwater(2)	Tapwater	Tapwater	Site Worker	Adult	Dermal, Ingestion	On-site	Quant (3)	Future site workers could use groundwater as a potable water source. Site workers could ingest drinking water and could have dermal contact with groundwater while hand washing.
				Hypothetical Resident	Adult, Child	Dermal, Ingestion	On-site	Quant	Future hypothetical residents could use groundwater as a potable water source. Residents could ingest drinking water and could have dermal contact with groundwater while showering.
		Household Air (Domestic Use)	Vapors in House (Domestic Use)	Hypothetical Resident	Adult, Child	Inhalation	On-site	Quant	Future hypothetical residents could be exposed to vapors in household air via inhalation.
		Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Hypothetical Resident	Adult, Child	Inhalation	On-Site	Quant	Future hypothetical residents could inhale volatile groundwater constituents in indoor air from vapor intrusion.
				Site Worker	Adult	Inhalation	On-site	Quant (3)	Site workers could inhale volatile groundwater constituents in indoor air from vapor intrusion.
	Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Construction/ Utility Worker	Adult	Dermal, Ingestion	On-site	Quant (3)	Construction/utility workers could incidentally ingest and have dermal contact with shallow groundwater in a trench while replacing the culverts within the North Burn Pads.
		Trench Air	Vapors in a Trench	Construction/ Utility Worker	Adult	Inhalation	On-site	Quant (3)	Construction/utility workers could inhale volatile groundwater constituents in trench air while replacing culverts within the North Burn Pads.

Notes:
Quant: Quantitative evaluation

(1) Surface water and sediment are not evaluated in the North Burn Pads HHRA. Surface water and sediment for the entire Explosives Disposal Area is being evaluated with the West Burn Pad Area HHRA.
(2) Groundwater is not currently being used as a potable water source and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the North Burn Pads is classified as Class IIB, a potential source of drinking water. Therefore, the HHRA evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This requires the evaluation of future residential exposures to groundwater.
(3) Potential exposures to groundwater are only estimated for a site worker and construction/utility worker if the estimated risks for a hypothetical residential scenario exceed acceptable risk levels and COCs are identified for a residential scenario.

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater/Household Air (Domestic Use)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
Tapwater/ Vapors in House (Domestic Use) North Burn Pads	2691-41-0	HMX	8.8E-02	J	8.8E-02	J	ug/L	JAW-11	1 / 5	0.088 - 0.2	8.8E-02	NA	1.0E+02	nc	4.0E+02	LHA	No	BSL
	5755-27-1	MNX	1.0E-01	J	1.0E-01	J	ug/L	NBP-MW1	1 / 5	0.093 - 0.29	1.0E-01	NA	NTX		NA	NA	No	BSL
	7440-39-3	Barium	2.3E+01	J	1.8E+02	J	ug/L	JAW-14	6 / 6	-	1.8E+02	4.3E+02	3.8E+02	nc	2.0E+03	MCL	No	BSL
	7440-47-3	Chromium	6.2E-01	J	2.4E+00	J	ug/L	JAW-11	4 / 6	10 - 10	2.4E+00	3.1E+01	3.5E-02	ca	1.0E+02	MCL	Yes	ASL
	7439-92-1	Lead	1.7E+00	J	1.7E+00	J	ug/L	JAW-14	1 / 6	10 - 10	1.7E+00	1.8E+01	1.5E+01	L	1.5E+01	MCL	No	BSL
	7782-49-2	Selenium	1.6E+00	J	1.8E+00	J	ug/L	JAW-14	2 / 6	10 - 10	1.8E+00	1.0E+01	1.0E+01	nc	5.0E+01	MCL	No	BSL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03		2.0E+03		ug/L	JAW-13	1 / 1	20 - 20	2.0E+03	NA	1.0E+03	nc	NA	NA	Yes	ASL
	74-83-9	Bromomethane	2.2E-01	J	2.2E-01	J	ug/L	JAW-13	1 / 1	0.21 - 0.21	2.2E-01	NA	7.5E-01	nc	1.0E+01	LHA	No	BSL
	67-66-3	Chloroform	1.7E-01	J	1.7E-01	J	ug/L	JAW-13	1 / 1	0.16 - 0.16	1.7E-01	NA	2.2E-01	ca	8.0E+01	MCL	No	BSL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Regional Screening Levels (RSL) for Tap Water (May 2023). Concentrations based on non-carcinogenic health effects are based on HQ=0.1.
The RSL for Chromium(VI) was used for Chromium, total.

(4) Values are the Federal Maximum Contaminant Levels (MCLs) and if no MCL was available, the EPA's (March 2018) Office of Water Lifetime Health Advisory (LHA) was provided.

(5) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
nc = noncarcinogenic
µg/L= microgram per liter

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Indoor Air (Vapor Intrusion) North Burn Pads	2691-41-0	HMX	8.8E-02 J	8.8E-02 J	ug/L	JAW-11	1 / 5	0.088 - 0.2	8.8E-02	NA	NSV	NA	NA	No	NSV
	5755-27-1	MNX	1.0E-01 J	1.0E-01 J	ug/L	NBP-MW1	1 / 5	0.093 - 0.29	1.0E-01	NA	NTX	NA	NA	No	NTX
	7440-39-3	Barium	2.3E+01 J	1.8E+02 J	ug/L	JAW-14	6 / 6	-	1.8E+02	4.3E+02	NSV	NA	NA	No	NSV
	7440-47-3	Chromium	6.2E-01 J	2.4E+00 J	ug/L	JAW-11	4 / 6	10 - 10	2.4E+00	3.1E+01	NSV	NA	NA	No	NSV
	7439-92-1	Lead	1.7E+00 J	1.7E+00 J	ug/L	JAW-14	1 / 6	10 - 10	1.7E+00	1.8E+01	NTX	NA	NA	No	NTX
	7782-49-2	Selenium	1.6E+00 J	1.8E+00 J	ug/L	JAW-14	2 / 6	10 - 10	1.8E+00	1.0E+01	NSV	NA	NA	No	NSV
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	2.0E+03	ug/L	JAW-13	1 / 1	20 - 20	2.0E+03	NA	3.8E+01 NC	NA	NA	Yes	ASL
	74-83-9	Bromomethane	2.2E-01 J	2.2E-01 J	ug/L	JAW-13	1 / 1	0.21 - 0.21	2.2E-01	NA	2.5E+00 NC	NA	NA	No	BSL
	67-66-3	Chloroform	1.7E-01 J	1.7E-01 J	ug/L	JAW-13	1 / 1	0.16 - 0.16	1.7E-01	NA	1.3E+00 CA	NA	NA	No	BSL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Residential Groundwater Vapor Intrusion Screening Level (May 2023). Concentration based on site specific groundwater temperature of 13°C and non-carcinogenic health effects are based on HQ=0.1.

(4) Rationale Codes:

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Not Sufficiently Volatile (NSV)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
COPC = Chemical of Potential Concern
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
nc = noncarcinogenic
μg/L= microgram per liter

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater in a Trench

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier		Maximum Concentration Qualifier		Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
Groundwater	2691-41-0	HMX	8.8E-02	J	8.8E-02	J	ug/L	JAW-11	1 / 2	0.088 - 0.2	8.8E-02	NA	1.0E+02	nc	4.0E+02	LHA	No	BSL
(Shallow Groundwater/Vapors	5755-27-1	MNX	1.0E-01	J	1.0E-01	J	ug/L	NBP-MW1	1 / 2	0.093 - 0.29	1.0E-01	NA	NTX		NA	NA	No	BSL
in a Trench)	7440-39-3	Barium	7.0E+01	J	9.0E+01	J	ug/L	JAW-11	2 / 2	-	9.0E+01	4.3E+02	3.8E+02	nc	2.0E+03	MCL	No	BSL
North Burn Pads	7440-47-3	Chromium	2.4E+00	J	2.4E+00	J	ug/L	JAW-11	1 / 2	10 - 10	2.4E+00	3.1E+01	3.5E-02	ca	1.0E+02	MCL	Yes	ASL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Regional Screening Levels (RSL) for Tap Water (May 2023). Concentrations based on non-carcinogenic health effects are based on HQ=0.1.

(4) Values are the Federal Maximum Contaminant Levels (MCLs) and if no MCL was available, the EPA's (March 2018) Office of Water Lifetime Health Advisory (LHA) was provided.

(5) Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
nc = noncarcinogenic
μg/L= microgram per liter

TABLE 3.1.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale
Tapwater North Burn Pads	Chromium	µg/L	1.4E+00	NA	2.4E+00 J	2.4E+00	µg/L	Sitewide Max	1
	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	NA	NA	2.0E+03	2.0E+03	µg/L	Sitewide Max	1

Notes:
Statistics: Max - Maximum Detected Value

* Arithmetic mean of detected concentrations are presented.

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples collected.

µg/L = microgram per liter
EPC = Exposure Point Concentration
J = compound was detected below the reporting limit in the sample
NA = Not Available
RME = Reasonable Maximum Exposure
UCL = Upper Confidence Limit

TABLE 3.2.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	µg/L	NA	NA	2.0E+03	2.0E+03	µg/L	Sitewide Max	1

Notes:
Statistics: Max - Maximum Detected Value

* Arithmetic mean of detected concentrations are presented.

(1) The maximum detected concentration was used as the EPC to evaluate the vapor intrusion pathway.

EPC = Exposure Point Concentration
NA = not applicable
UCL = Upper Confidence Limit
µg/L = microgram per liter

TABLE 3.2.RME SUPPLEMENT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	Chemical of Potential Concern (1)	Exposure Point Concentration in Groundwater		Exposure Point Concentration in Indoor Air	
		Value (2)	Units	Value (3)	Units
Indoor Air (Vapor Intrusion)	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	2.7E+04	µg/m^3

Notes:
(1) Chemicals of Potential Concern from Table 2.2.RME.
(2) Selection of exposure point concentration from Table 3.2.RME.
(3) The indoor air concentrations for groundwater-to-indoor air were estimated using the EPA's VISL Calculator, May 2023 (EPA, 2023).
Site-specific groundwater temperature of 13 degrees C used to estimate indoor air concentrations.

µg/L = microgram per liter
µg/m^3 = microgram per cubic meter

TABLE 3.3.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater/Trench Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration *			
						Value	Units	Statistic	Rationale
Shallow Groundwater in Trench/ North Burn Pads	Chromium	µg/L	NA	NA	2.4E+00 J	2.4E+00	µg/L	Sitewide Max	1

Notes:
Statistics: Max - Maximum Detected Value

* Arithmetic mean of detected concentrations are presented.

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.

µg/L = microgram per liter
EPC = Exposure Point Concentration
J = compound was detected below the reporting limit in the sample
NA = Not Available
RME = Reasonable Maximum Exposure
UCL = Upper Confidence Limit

TABLE 4 RME SUPPLEMENT
RECEPTOR-SPECIFIC EXPOSURE FACTORS FOR HYPOTHETICAL RESIDENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor: Hypothetical Resident

					Water	
Age Group	Age-dependent Adjustment Factor (ADAF)	Exposure Frequency (EF)	Exposure Duration (ED)	Body Weight (BW)	Ingestion	IR-W-Adj
		(day/year)	(years)	(kg)	(L/day)	(L/kg)
Child (0-2)	10	350	2	15	0.78	364
Child (2-6)	3	350	4	15	0.78	218
Adolescent (6-16)	3	350	10	80	2.5	328
Adult (16-26)	1	350	10	80	2.5	109
Total			26			1,020

Equations
Ingestion (water): Total IR-W-Adj (MMOA) [L/kg} = Sum (ADAF x EF x ED x IR-S x 1/BW)

Sources:
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-18/259F, 2019.

MMOA - Mutagenic mode of action
ADAF - Age-dependent Adjustment Factor
kg = Kilogram
L/day = Liter per day

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	2.5	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	0.78	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				BW	Body Weight	15	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	CDI (mg/kg-day) =
				IR-W-Adj	Ingestion Rate of Water, Age-adjusted	0.94	liter-year/kg-day	Calculated	CW x IR-W-Adj x EF x CF1 x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	IR-W-Adj (liter-year/kd-day) =
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	(ED-C x IR-W-C / BW-C) + (ED-A x IR-W-A / BW-A)
	Site Worker	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	1	L/day	(5)	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 2014	
				ED	Exposure Duration	25	years	EPA, 2014	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	19,652	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.71	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	80	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,365	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.54	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	CDI (mg/kg-day) = DA-Adj x EF x EV x 1/AT
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	Calculated	mg-year/event-kg	Calculated	DA-Adj = (DAevent-A x SA-A x ED-A x 1/BW-A)
				EV	Event Frequency	1	events/day	EPA, 2004	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
	Site Worker	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	2,500	cm^2	EPA, 2014 (3)	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	EPA, 1991	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.2	hr/event	(4)	x CF1 x CF2
				EF	Exposure Frequency	250	days/year	EPA, 2014	
				ED	Exposure Duration	25	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	80	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.
(3) The SA for a site worker exposed to tap water is based on face, forearms, and hands.
(4) Based on best professional judgment (total of 12 minutes per day).
(5) March 1996 Interagency Agreement Dispute Resolution.

Sources:
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

cm/hr = Centimeter per hour
cm^2 = Square centimeter
mg/µg = Milligram per microgram
kg = Kilogram
L/cm^3 = Liter per cubic centimeter
L/day = Liter per day
mg/cm^2 -event = Milligram per square centimeter per event
mg/kg-day = Milligram per kilogram per day
µg/L = Microgram per liter

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Household Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Hypothetical Resident	Adult	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	Exposure Concentration (EC) (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	
		Child	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	Exposure Concentration (EC) (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	
		Child/Adult Aggregate	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1	µg/L	See Table 3.1	EC (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	

Notes:

(1) Calculated as the product of ED (years) x 365 days/year.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 1991. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals). Office of Emergency and Remedial Response. EPA/540/R-92/003. December 1991.
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

L/m^3 = Liter per cubic meter
µg/L = Microgram per liter

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Site Worker	Adult	Indoor Air	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	Exposure Concentration (EC) (mg/m^3) =
			(Vapor Intrusion)	CA	Chemical Concentration in Air	See Table 3.2.RME Supplement	µg/m^3	See Table 3.2.RME Supplement	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	8	hr/day	EPA, 2014	
				EF	Exposure Frequency	250	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	25	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
	Resident	Adult	Indoor Air	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
			(Vapor Intrusion)	CA	Chemical Concentration in Indoor Air	See Table 3.2.RME Supplement	µg/m^3	See Table 3.2.RME Supplement	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	20	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
		Child	Indoor Air	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
			(Vapor Intrusion)	CA	Chemical Concentration in Air	See Table 3.2.RME Supplement	µg/m^3	See Table 3.2.RME Supplement	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	6	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
		Child/Adult	Indoor Air	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
		Aggregate	(Vapor Intrusion)	CA	Chemical Concentration in Air	See Table 3.2.RME Supplement	µg/m^3	See Table 3.2.RME Supplement	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration, Resident	26	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

Notes:

(1) Calculated as the product of ED (years) x 365 days/year.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA, 2023: Vapor Intrusion Screening Levels (VISL) Calculator tool. May.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD	
		Value	Units	(1)	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Chromium (hexavalent)	Chronic	3.0E-03	mg/kg-day	2.5%	7.5E-05	mg/kg-day	NOE	3 / 300	IRIS	09/18/2023
Chromium (hexavalent)	Subchronic	5.0E-03	mg/kg-day	2.5%	1.3E-04	mg/kg-day	Hematologic	100	ATSDR	09/2012
1,1,2-Trichlorotrifluoroethane (Freon 113)	Chronic/Subchronic	3.0E+01	mg/kg-day	100%	3.0E+01	mg/kg-day	Neurological	10	IRIS	09/18/2023

Note:
(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.
(2) Adjusted based on RAGS Part E.

Definitions:
ATSDR = Agency for Toxic Substances & Disease Registry Minimal Risk Levels
IRIS = Integrated Risk Information System
NOE = No Observed Effects

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,2-Trichlorotrifluoroethane (Freon 113)	Chronic	5.0E+00	mg/m^3	NOE	300	PPRTV	09/26/2016
1,1,2-Trichlorotrifluoroethane (Freon 113)	Subchronic	5.0E+01	mg/m^3	NOE	30	PPRTV	09/26/2016

Definitions:
NA = Not Available
NOE = No Observed Effects
PPRTV = Provisional Peer-Reviewed Toxicity Value

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Chromium (hexavalent) (3)	5.0E-01	$(mg/kg\text{-}day)^{-1}$	2.5%	2.0E+01	$(mg/kg\text{-}day)^{-1}$	Cannot determine (oral)	Cal EPA	09/18/2023
1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NA	NA	NA	NA

Note:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral slope factor should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) This chemical operates with a mutagenic mode of action (EPA, 2005) and would exhibit a greater effect in early-life versus later-life exposure. Chemical-specific toxicity data are not available for childhood and early-life exposures; thus, EPA (2005) default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<26	1

Definitions:
Cal EPA = California Environmental Protection Agency
NA = Not Available

Weight of Evidence definitions (EPA, 1986):
Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.
Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.
Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NA

Note:
Weight of Evidence definitions (EPA, 1986):
Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.
Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.
Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

Definitions:
IRIS = Integrated Risk Information System
NA = Not Available

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS AND NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future	
Receptor Population: Hypothetical Resident	
Receptor Age: Adult	

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Indoor Air	Indoor Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.7E+04	µg/m^3	NA	NA	NA	NA	NA	2.6E+01	mg/m^3	5.0E+00	mg/m3	5.3E+00
			Exp. Route Total								NA					5.3E+00
		Exposure Point Total									NA					5.3E+00
	Exposure Medium Total										NA					5.3E+00
	Tapwater	Tapwater	Ingestion	Chromium	2.4E+00	µg/L	NA	NA	NA	NA	NA	7.2E-05	mg/kg/day	3.0E-03	mg/kg/day	2.4E-02
				1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	NA	NA	NA	NA	NA	6.0E-02	mg/kg/day	3.0E+01	mg/kg/day	2.0E-03
			Exp. Route Total								NA					2.6E-02
			Dermal	Chromium	2.4E+00	µg/L	NA	NA	NA	NA	NA	4.0E-07	mg/kg/day	7.5E-05	mg/kg/day	5.4E-03
				1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	NA	NA	NA	NA	NA	2.1E-02	mg/kg/day	3.0E+01	mg/kg/day	6.9E-04
			Exp. Route Total								NA					6.0E-03
		Exposure Point Total									NA					3.2E-02
	Exposure Medium Total										NA					3.2E-02
	Household Air	Vapors in House	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.00E+03	µg/L	NA	NA	NA	NA	NA	9.6E-01	mg/m^3	5.0E+00	mg/m3	1.9E-01
			Exp. Route Total								NA					1.9E-01
		Exposure Point Total									NA					1.9E-01
	Exposure Medium Total										NA					1.9E-01
Groundwater Total											NA					5.5E+00
Receptor Total											NA					5E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.1.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chromium	2.4E+00	1.0E-03	NA	NA	NA	1.0E+00	0.71	1.7E-09	1
1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.71	8.8E-05	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \le t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS AND NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Indoor Air	Indoor Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.7E+04	μg/m^3	NA	NA	NA	NA	NA	2.6E+01	mg/m^3	5.0E+00	mg/m3	5.3E+00
			Exp. Route Total								NA					5.3E+00
		Exposure Point Total									NA					5.3E+00
	Exposure Medium Total										NA					5.3E+00
	Tapwater	Tapwater	Ingestion	Chromium	2.4E+00	μg/L	NA	NA	NA	NA	NA	1.2E-04	mg/kg/day	3.0E-03	mg/kg/day	4.0E-02
				1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	μg/L	NA	NA	NA	NA	NA	1.0E-01	mg/kg/day	3.0E+01	mg/kg/day	3.3E-03
			Exp. Route Total								NA					4.3E-02
			Dermal	Chromium	2.40E+00	μg/L	NA	NA	NA	NA	NA	5.3E-07	mg/kg/day	7.5E-05	mg/kg/day	7.0E-03
				1,1,2-Trichlorotrifluoroethane (Freon 113)	2.00E+03	μg/L	NA	NA	NA	NA	NA	3.1E-02	mg/kg/day	3.0E+01	mg/kg/day	1.0E-03
			Exp. Route Total								NA					8.1E-03
		Exposure Point Total									NA					5.1E-02
	Exposure Medium Total										NA					5.1E-02
	Household Air	Household Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	μg/L	NA	NA	NA	NA	NA	9.6E-01	mg/m^3	5.0E+00	mg/m3	1.9E-01
			Exp. Route Total								NA					1.9E-01
		Exposure Point Total									NA					1.9E-01
	Exposure Medium Total										NA					1.9E-01
Groundwater Total											NA					5.5E+00
Receptor Total											NA					5E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
μg/L = microgram per liter
μg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.2.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chromium	2.4E+00	1.0E-03	NA	NA	NA	1.0E+00	0.54	1.3E-09	1
1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.54	7.7E-05	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS AND NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Indoor Air	Indoor Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.7E+04	µg/m^3	9.8E+00	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								NA					NA
		Exposure Point Total									NA					NA
	Exposure Medium Total										NA					NA
	Tapwater	Tapwater	Ingestion	Chromium	2.4E+00	µg/L	3.1E-05	mg/kg/day	5.0E-01	1/(mg/kg/day)	4.8E-05	NA	NA	NA	NA	NA
				1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	2.6E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								4.8E-05					NA
			Dermal	Chromium	2.4E+00	µg/L	1.6E-07	mg/kg/day	2.0E+01	1/(mg/kg/day)	9.4E-06	NA	NA	NA	NA	NA
				1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	8.6E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								9.4E-06					NA
		Exposure Point Total									5.7E-05					NA
	Exposure Medium Total										5.7E-05					NA
	Household Air	Household Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	3.6E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								NA					NA
		Exposure Point Total									NA					NA
	Exposure Medium Total										NA					NA
Groundwater Total											5.7E-05					NA
Receptor Total											6E-05					NA

Notes:

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

µg/L = microgram per liter

µg/m^3= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 7.3.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS FOR COPC WITH MUTAGENIC MODE OF ACTION

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations										
							Intake					CSF/Unit Risk					Cancer Risk
					Value	Units	Value				Units	Value				Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)		
Groundwater North Burn Pads	Tapwater	Tapwater	Ingestion	Chromium	2.4E+00	ug/L	3.4E-06	6.8E-06	1.0E-05	1.0E-05	mg/kg-day	5.0E+00	1.5E+00	1.5E+00	5.0E-01	1/(mg/kg-day)	4.8E-05
			Dermal	Chromium	2.4E+00	ug/L	1.5E-08	3.0E-08	5.7E-08	5.7E-08	mg/kg-day	2.0E+02	6.0E+01	6.0E+01	2.0E+01	1/(mg/kg-day)	9.4E-06

ADAF = Age-dependent adjustment factor
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
μg/L = microgram per liter
μg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Tapwater	Tapwater	Ingestion	Chromium	2.4E+00	µg/L	NA	NA	NA	NA	NA	7.2E-05	mg/kg/day	3.0E-03	mg/kg/day	2.4E-02
			Exp. Route Total								NA					2.4E-02
			Dermal	Chromium	2.4E+00	µg/L	NA	NA	NA	NA	NA	4.0E-07	mg/kg/day	7.5E-05	mg/kg/day	5.4E-03
			Exp. Route Total								NA					5.4E-03
		Exposure Point Total									NA					2.9E-02
	Exposure Medium Total										NA					2.9E-02
Groundwater Total											NA					2.9E-02
Receptor Total											NA					3E-02

Notes:

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

µg/L = microgram per liter

TABLE 7.4.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chromium	2.4E+00	1.0E-03	NA	NA	NA	1.0E+00	0.71	1.7E-09	1

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Tapwater	Tapwater	Ingestion	Chromium	2.4E+00	µg/L	NA	NA	NA	NA	NA	1.2E-04	mg/kg/day	3.0E-03	mg/kg/day	4.0E-02
			Exp. Route Total								NA					4.0E-02
			Dermal	Chromium	2.40E+00	µg/L	NA	NA	NA	NA	NA	5.3E-07	mg/kg/day	7.5E-05	mg/kg/day	7.0E-03
			Exp. Route Total								NA					7.0E-03
		Exposure Point Total									NA					4.7E-02
	Exposure Medium Total										NA					4.7E-02
Groundwater Total											NA					4.7E-02
Receptor Total											NA					5E-02

Notes:

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

µg/L = microgram per liter

TABLE 7.5.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Chromium	2.4E+00	1.0E-03	NA	NA	NA	1.0E+00	0.54	1.3E-09	1

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Tapwater	Tapwater	Ingestion	Chromium	2.4E+00	µg/L	3.1E-05	mg/kg/day	5.0E-01	1/(mg/kg/day)	4.8E-05	NA	NA	NA	NA	NA
			Exp. Route Total								4.8E-05					NA
			Dermal	Chromium	2.4E+00	µg/L	1.6E-07	mg/kg/day	2.0E+01	1/(mg/kg/day)	9.4E-06	NA	NA	NA	NA	NA
			Exp. Route Total								9.4E-06					NA
		Exposure Point Total									5.7E-05					NA
	Exposure Medium Total										5.7E-05					NA
Groundwater Total											5.7E-05					NA
Receptor Total											6E-05					NA

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter

TABLE 7.6.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS FOR COPC WITH MUTAGENIC MODE OF ACTION

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations										
							Intake					CSF/Unit Risk					Cancer Risk
					Value	Units	Value				Units	Value				Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)		
Groundwater North Burn Pads	Tapwater	Tapwater	Ingestion	Chromium	2.4E+00	ug/L	3.4E-06	6.8E-06	1.0E-05	1.0E-05	mg/kg-day	5.0E+00	1.5E+00	1.5E+00	5.0E-01	1/(mg/kg-day)	4.8E-05
			Dermal	Chromium	2.4E+00	ug/L	1.5E-08	3.0E-08	5.7E-08	5.7E-08	mg/kg-day	2.0E+02	6.0E+01	6.0E+01	2.0E+01	1/(mg/kg-day)	9.4E-06

ADAF = Age-dependent adjustment factor
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Indoor Air	Indoor Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.7E+04	μg/m³	2.2E+00	mg/m³	NA	NA	NA	6.3E+00	mg/m³	5.0E+00	mg/m3	1.3E+00
			Exp. Route Total								NA					1.3E+00
		Exposure Point Total									NA					1.3E+00
	Exposure Medium Total										NA					1.3E+00
	Tapwater	Tapwater	Ingestion	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	μg/L	6.1E-03	mg/kg/day	NA	NA	NA	1.7E-02	mg/kg/day	3.0E+01	mg/kg/day	5.7E-04
			Exp. Route Total								NA					5.7E-04
			Dermal	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	μg/L	3.6E-04	mg/kg/day	NA	NA	NA	1.0E-03	mg/kg/day	3.0E+01	mg/kg/day	3.4E-05
			Exp. Route Total								NA					3.4E-05
		Exposure Point Total									NA					6.0E-04
	Exposure Medium Total										NA					6.0E-04
Groundwater Total											NA					1.3E+00
Receptor Total											NA					1E+00

Notes:

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

μg/m³= microgram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

mg/m³ = milligram per cubic meter

μg/L = microgram per liter

TABLE 7.7.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.20	4.7E-05	2

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Indoor Air	Indoor Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.7E+04	µg/m^3	NA	NA	NA	NA	NA	2.6E+01	mg/m^3	5.0E+00	mg/m3	5.3E+00
			Exp. Route Total								NA					5.3E+00
		Exposure Point Total									NA					5.3E+00
	Exposure Medium Total										NA					5.3E+00
	Tapwater	Tapwater	Ingestion	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	NA	NA	NA	NA	NA	6.0E-02	mg/kg/day	3.0E+01	mg/kg/day	2.0E-03
			Exp. Route Total								NA					2.0E-03
			Dermal	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	NA	NA	NA	NA	NA	2.1E-02	mg/kg/day	3.0E+01	mg/kg/day	6.9E-04
			Exp. Route Total								NA					6.9E-04
		Exposure Point Total									NA					2.7E-03
	Exposure Medium Total										NA					2.7E-03
	Household Air	Vapors in House	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	NA	NA	NA	NA	NA	9.6E-01	mg/m^3	5.0E+00	mg/m3	1.9E-01
			Exp. Route Total								NA					1.9E-01
		Exposure Point Total									NA					1.9E-01
	Exposure Medium Total										NA					1.9E-01
Groundwater Total											NA					5.4E+00
Receptor Total											NA					5E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.8.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.71	8.8E-05	2

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
$2 \times FA \times Kp \times Cw \times (\mathrm{sqrt}((6 \times \tau \times t_{event}) / (3.1415))) \times CF1 \times CF2$ (Eq 2)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Indoor Air	Indoor Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.7E+04	µg/m^3	NA	NA	NA	NA	NA	2.6E+01	mg/m^3	5.0E+00	mg/m3	5.3E+00
			Exp. Route Total								NA					5.3E+00
		Exposure Point Total									NA					5.3E+00
	Exposure Medium Total										NA					5.3E+00
	Tapwater	Tapwater	Ingestion	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	NA	NA	NA	NA	NA	1.0E-01	mg/kg/day	3.0E+01	mg/kg/day	3.3E-03
			Exp. Route Total								NA					3.3E-03
			Dermal	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.00E+03	µg/L	NA	NA	NA	NA	NA	3.1E-02	mg/kg/day	3.0E+01	mg/kg/day	1.0E-03
			Exp. Route Total								NA					1.0E-03
		Exposure Point Total									NA					4.4E-03
	Exposure Medium Total										NA					4.4E-03
	Household Air	Vapors in House	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	µg/L	NA	NA	NA	NA	NA	9.6E-01	mg/m^3	5.0E+00	mg/m3	1.9E-01
			Exp. Route Total								NA					1.9E-01
		Exposure Point Total									NA					1.9E-01
	Exposure Medium Total										NA					1.9E-01
Groundwater Total											NA					5.5E+00
Receptor Total											NA					5E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.9.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	1.8E-02	9.2E-02	1.2E+00	2.8E+00	1.0E+00	0.54	7.7E-05	2

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.10.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future	
Receptor Population: Hypothetical Resident	
Receptor Age: Adult/Child Aggregate	

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater North Burn Pads	Indoor Air	Indoor Air	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.7E+04	μg/m^3	9.8E+00	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								NA					NA
		Exposure Point Total									NA					NA
	Exposure Medium Total										NA					NA
	Tapwater	Tapwater	Ingestion	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	μg/L	2.6E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								NA					NA
			Dermal	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	μg/L	8.6E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								NA					NA
		Exposure Point Total									NA					NA
	Exposure Medium Total										NA					NA
	Household Air	Vapors in House	Inhalation	1,1,2-Trichlorotrifluoroethane (Freon 113)	2.0E+03	μg/L	3.6E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								NA					NA
		Exposure Point Total									NA					NA
	Exposure Medium Total										NA					NA
Groundwater Total											NA					NA
Receptor Total											NA					NA

Notes:

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

μg/L = microgram per liter

μg/m^3= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS AND NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+00	NA	5E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Tapwater	Tapwater	Chromium	NA	NA	NA	NA	NOE	2E-02	NA	5E-03	3E-02
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	2E-03	NA	7E-04	3E-03
		Exposure Point Total		NA	NA	NA	NA		3E-02	NA	6E-03	3E-02
	Exposure Medium Total			NA	NA	NA	NA		3E-02	NA	6E-03	3E-02
	Household Air	Vapors in House	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E-01	NA	2E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E-01	NA	2E-01
Groundwater Total				NA	NA	NA	NA		3E-02	5E+00	6E-03	5E+00
Receptor Total				NA	NA	NA	NA		3E-02	5E+00	6E-03	5E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = no observed effects

Total Target Organ HIs (Groundwater):

Total Nervous HI Across Media =	0.003
Total NOE HI Across Media =	**5**

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS AND NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+00	NA	5E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Tapwater	Tapwater	Chromium	NA	NA	NA	NA	NOE	4E-02	NA	7E-03	5E-02
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	3E-03	NA	1E-03	4E-03
		Exposure Point Total		NA	NA	NA	NA		4E-02	NA	8E-03	5E-02
	Exposure Medium Total			NA	NA	NA	NA		4E-02	NA	8E-03	5E-02
	Household Air	Household Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E-01	NA	2E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E-01	NA	2E-01
Groundwater Total				NA	NA	NA	NA		4E-02	5E+00	8E-03	5E+00
Receptor Total				NA	NA	NA	NA		4E-02	5E+00	8E-03	5E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = no observed effects

Total Target Organ HIs (Groundwater):

Total Nervous HI Across Media =	0.004
Total NOE HI Across Media =	**5**

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS AND NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	NA	NA	NA
		Exposure Point Total		NA	NA	NA	NA		NA	NA	NA	NA
	Exposure Medium Total			NA	NA	NA	NA		NA	NA	NA	NA
	Tapwater	Tapwater	Chromium	5E-05	NA	9E-06	6E-05	NOE	NA	NA	NA	NA
			1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	NA	NA	NA	NA
		Exposure Point Total		5E-05	NA	9E-06	6E-05		NA	NA	NA	NA
	Exposure Medium Total			5E-05	NA	9E-06	6E-05		NA	NA	NA	NA
	Household Air	Household Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	NA	NA	NA
		Exposure Point Total		NA	NA	NA	0E+00		NA	NA	NA	NA
	Exposure Medium Total			NA	NA	NA	0E+00		NA	NA	NA	NA
Groundwater Total				5E-05	NA	9E-06	6E-05		NA	NA	NA	NA
Receptor Total				5E-05	NA	9E-06	6E-05		NA	NA	NA	NA

Notes: NA = Not applicable or not available; NOE = no observed effects

TABLE 9.4.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Tapwater	Tapwater	Chromium	NA	NA	NA	NA	NOE	2E-02	NA	5E-03	3E-02
		Exposure Point Total		NA	NA	NA	NA		2E-02	NA	5E-03	3E-02
	Exposure Medium Total			NA	NA	NA	NA		2E-02	NA	5E-03	3E-02
Groundwater Total				NA	NA	NA	NA		2E-02	NA	5E-03	3E-02
Receptor Total				NA	NA	NA	NA		2E-02	NA	5E-03	3E-02

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = No observed effects

Total Target Organ HIs (Groundwater):

Total NOE HI Across Media = 0.03

TABLE 9.5.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe:	Future
Receptor Population:	Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Tapwater	Tapwater	Chromium	NA	NA	NA	NA	NOE	4E-02	NA	7E-03	5E-02
		Exposure Point Total		NA	NA	NA	NA		4E-02	NA	7E-03	5E-02
	Exposure Medium Total			NA	NA	NA	NA		4E-02	NA	7E-03	5E-02
Groundwater Total				NA	NA	NA	NA		4E-02	NA	7E-03	5E-02
Receptor Total				NA	NA	NA	NA		4E-02	NA	7E-03	5E-02

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = No observed effects

Total Target Organ HIs (Groundwater):

Total NOE HI Across Media = 0.05

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY-OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Tapwater	Tapwater	Chromium	5E-05	NA	9E-06	6E-05	NOE	NA	NA	NA	NA
		Exposure Point Total		5E-05	NA	9E-06	6E-05		NA	NA	NA	NA
	Exposure Medium Total			5E-05	NA	9E-06	6E-05		NA	NA	NA	NA
Groundwater Total				5E-05	0E+00	9E-06	6E-05		NA	NA	NA	NA
Receptor Total				5E-05	0E+00	9E-06	6E-05		NA	NA	NA	NA

Notes: NA = Not applicable or not available; NOE = No observed effects

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	1E+00	NA	1E+00
		Exposure Point Total		NA	NA	NA	NA		NA	1E+00	NA	1E+00
	Exposure Medium Total			NA	NA	NA	NA		NA	1E+00	NA	1E+00
	Tapwater	Tapwater	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	6E-04	NA	3E-05	6E-04
		Exposure Point Total		NA	NA	NA	NA		6E-04	NA	3E-05	6E-04
	Exposure Medium Total			NA	NA	NA	NA		6E-04	NA	3E-05	6E-04
Groundwater Total				NA	NA	NA	NA		6E-04	1E+00	3E-05	1E+00
Receptor Total				NA	NA	NA	NA		6E-04	1E+00	3E-05	1E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = no observed effects

Total Target Organ HIs (Groundwater):

Total Nervous HI Across Media =	0.0006
Total NOE HI Across Media =	1

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+00	NA	5E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Tapwater	Tapwater	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	2E-03	NA	7E-04	3E-03
		Exposure Point Total		NA	NA	NA	NA		2E-03	NA	7E-04	3E-03
	Exposure Medium Total			NA	NA	NA	NA		2E-03	NA	7E-04	3E-03
	Household Air	Vapors in House	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E-01	NA	2E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E-01	NA	2E-01
Groundwater Total				NA	NA	NA	NA		2E-03	5E+00	7E-04	5E+00
Receptor Total				NA	NA	NA	NA		2E-03	5E+00	7E-04	5E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = no observed effects

Total Target Organ HIs (Groundwater):

Total Nervous HI Across Media =	0.003
Total NOE HI Across Media =	**5**

TABLE 9.9.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+00	NA	5E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Tapwater	Tapwater	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	3E-03	NA	1E-03	4E-03
		Exposure Point Total		NA	NA	NA	NA		3E-03	NA	1E-03	4E-03
	Exposure Medium Total			NA	NA	NA	NA		3E-03	NA	1E-03	4E-03
	Household Air	Vapors in House	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E-01	NA	2E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E-01	NA	2E-01
Groundwater Total				NA	NA	NA	NA		3E-03	5E+00	1E-03	5E+00
Receptor Total				NA	NA	NA	NA		3E-03	5E+00	1E-03	5E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = no observed effects

Total Target Organ HIs (Groundwater):

Total Nervous HI Across Media =	0.004
Total NOE HI Across Media =	**5**

TABLE 9.10.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	NA	NA	NA
		Exposure Point Total		NA	NA	NA	NA		NA	NA	NA	NA
	Exposure Medium Total			NA	NA	NA	NA		NA	NA	NA	NA
	Tapwater	Tapwater	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	Nervous	NA	NA	NA	NA
		Exposure Point Total		NA	NA	NA	NA		NA	NA	NA	NA
	Exposure Medium Total			NA	NA	NA	NA		NA	NA	NA	NA
	Household Air	Vapors in House	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	NA	NA	NA
		Exposure Point Total		NA	NA	NA	NA		NA	NA	NA	NA
	Exposure Medium Total			NA	NA	NA	NA		NA	NA	NA	NA
Groundwater Total				NA	NA	NA	NA		NA	NA	NA	NA
Receptor Total				NA	NA	NA	NA		NA	NA	NA	NA

Notes: NA = Not applicable or not available; NOE = no observed effects

TABLE 10.1.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+00	NA	5E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Household Air	Vapors in House	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E-01	NA	2E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E-01	NA	2E-01
Groundwater Total				NA	NA	NA	NA		NA	5E+00	NA	5E+00
Receptor Total				NA	NA	NA	NA		NA	5E+00	NA	5E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = no observed effects

Total Target Organ HIs (Groundwater):

Total NOE HI Across Media = **5**

TABLE 10.2.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
North Burn Pads
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Hypothetical Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater North Burn Pads	Indoor Air	Indoor Air	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	5E+00	NA	5E+00
		Exposure Point Total		NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	NA	NA	NA		NA	5E+00	NA	5E+00
	Household Air	Vapors in House	1,1,2-Trichlorotrifluoroethane (Freon 113)	NA	NA	NA	NA	NOE	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E-01	NA	2E-01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E-01	NA	2E-01
Groundwater Total				NA	NA	NA	NA		NA	5E+00	NA	5E+00
Receptor Total				NA	NA	NA	NA		NA	5E+00	NA	5E+00

Notes: HI = Hazard Index; NA = Not applicable or not available; NOE = no observed effects

Total Target Organ HIs (Groundwater):

Total NOE HI Across Media = **5**

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, North Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	1,3,5-Trinitrobenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	1,3-Dinitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2,4,6-Trinitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2,4-Dinitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2,6-Dinitrotoluene	0.2	U	ug/L	0.2	0.2
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2-Amino-4,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2-Nitrotoluene	0.2	UJ	ug/L	0.2	0.4
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	3-Nitrotoluene	0.4	UJ	ug/L	0.4	0.4
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	4-Amino-2,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	4-Nitrotoluene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	DNX	0.25	U	ug/L	0.25	0.5
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	HMX	0.088	J	ug/L	0.088	0.4
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	MNX	0.29	U	ug/L	0.29	0.5
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	Nitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	RDX	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	Tetryl	0.2	U	ug/L	0.2	0.24
AOC_GW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	TNX	0.25	U	ug/L	0.25	0.5
AOC_GW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Arsenic	10	U	ug/L	10	
AOC_GW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Barium	70.3	J	ug/L		
AOC_GW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Cadmium	5	U	ug/L	5	
AOC_GW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Chromium	10	U	ug/L	10	
AOC_GW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Lead	10	U	ug/L	10	
AOC_GW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Mercury	0.2	U	ug/L	0.2	
AOC_GW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Selenium	10	U	ug/L	10	
AOC_GW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Silver	10	U	ug/L	10	
AOC_GW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Arsenic	10	U	ug/L	10	
AOC_GW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Barium	89.6	J	ug/L		
AOC_GW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Cadmium	5	U	ug/L	5	
AOC_GW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Chromium	2.4	J	ug/L		
AOC_GW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Lead	10	U	ug/L	10	
AOC_GW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Mercury	0.2	U	ug/L	0.2	
AOC_GW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Selenium	10	U	ug/L	10	
AOC_GW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Silver	10	U	ug/L	10	
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	1,3,5-Trinitrobenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	1,3-Dinitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	2,4,6-Trinitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	2,4-Dinitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	2,6-Dinitrotoluene	0.2	U	ug/L	0.2	0.2
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	2-Amino-4,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	2-Nitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	3-Nitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	4-Amino-2,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	4-Nitrotoluene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	DNX	0.25	U	ug/L	0.25	0.5
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	HMX	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	MNX	0.29	U	ug/L	0.29	0.5
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	Nitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	RDX	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	Tetryl	0.2	U	ug/L	0.2	0.24
AOC_GW_NBP	JAW-12	JAW-12-0319	WG	3/24/2019	13	21	TNX	0.25	U	ug/L	0.25	0.5
AOC_GW_NBP	JAW-12	JAW-12-20020614	WG	6/14/2002	13	21	Arsenic	10	U	ug/L	10	
AOC_GW_NBP	JAW-12	JAW-12-20020614	WG	6/14/2002	13	21	Barium	23.4	J	ug/L		
AOC_GW_NBP	JAW-12	JAW-12-20020614	WG	6/14/2002	13	21	Cadmium	5	U	ug/L	5	
AOC_GW_NBP	JAW-12	JAW-12-20020614	WG	6/14/2002	13	21	Chromium	10	U	ug/L	10	
AOC_GW_NBP	JAW-12	JAW-12-20020614	WG	6/14/2002	13	21	Lead	10	U	ug/L	10	
AOC_GW_NBP	JAW-12	JAW-12-20020614	WG	6/14/2002	13	21	Mercury	0.2	U	ug/L	0.2	
AOC_GW_NBP	JAW-12	JAW-12-20020614	WG	6/14/2002	13	21	Selenium	10	U	ug/L	10	

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, North Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBP	JAW-12	JAW-12-20020614	WG	6/14/2002	13	21	Silver	10	U	ug/L	10	
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,3,5-Trinitrobenzene	0.39	U	ug/L	0.39	0.99
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,3-Dinitrobenzene	0.2	U	ug/L	0.2	0.39
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	2,4,6-Trinitrotoluene	0.39	U	ug/L	0.39	0.39
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	2,4-Dinitrotoluene	0.2	U	ug/L	0.2	0.39
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	2,6-Dinitrotoluene	0.2	U	ug/L	0.2	0.2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	2-Amino-4,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	2-Nitrotoluene	0.2	U	ug/L	0.2	0.39
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	3-Nitrotoluene	0.39	U	ug/L	0.39	0.39
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	4-Amino-2,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	4-Nitrotoluene	0.39	U	ug/L	0.39	0.99
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	DNX	0.25	U	ug/L	0.25	0.49
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	HMX	0.2	U	ug/L	0.2	0.39
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	MNX	0.29	U	ug/L	0.29	0.49
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Nitrobenzene	0.2	U	ug/L	0.2	0.39
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	RDX	0.39	U	ug/L	0.39	0.39
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Tetryl	0.2	U	ug/L	0.2	0.24
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	TNX	0.25	U	ug/L	0.25	0.49
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Naphthalene	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2,4-Trichlorobenzene	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2-Dichlorobenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,3-Dichlorobenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,4-Dichlorobenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Hexachlorobutadiene	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,1,1,2-Tetrachloroethane	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,1,1-Trichloroethane	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,1,2,2-Tetrachloroethane	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,1,2-Trichloroethane	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	=	ug/L	20	150
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,1-Dichloroethane	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,1-Dichloroethene	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,1-Dichloropropene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2,3-Trichlorobenzene	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2,3-Trichloropropane	0.8	U	ug/L	0.8	3
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2,4-Trimethylbenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2-Dibromo-3-chloropropane	1.6	U	ug/L	1.6	5
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2-Dibromoethane	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2-Dichloroethane	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,2-Dichloropropane	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,3,5-Trimethylbenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1,3-Dichloropropane	0.2	U	ug/L	0.2	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	1-Chlorohexane	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	2,2-Dichloropropane	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	2-Chlorotoluene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	2-Hexanone	4	U	ug/L	4	5
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	4-Isopropyltoluene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Acetone	6.4	U	ug/L	6.4	10
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Benzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Bromobenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Bromochloromethane	0.2	U	ug/L	0.2	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Bromodichloromethane	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Bromoform	1	U	ug/L	1	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Bromomethane	0.22	J	ug/L	0.21	2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Carbon disulfide	0.8	U	ug/L	0.8	2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Carbon tetrachloride	0.4	U	ug/L	0.4	2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Chloro methane	0.8	U	ug/L	0.8	2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Chlorobenzene	0.4	U	ug/L	0.4	1

ATTACHMENT 2
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Iowa Army Ammunition Plant, North Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Chloroethane	1.6	U	ug/L	1.6	2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Chloroform	0.17	J	ug/L	0.16	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	cis-1,2-Dichloroethene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	cis-1,3-Dichloropropene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Dibromochloromethane	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Dibromomethane	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Dichlorodifluoromethane	0.8	U	ug/L	0.8	2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Ethyl- benzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Isopropylbenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Methyl ethyl ketone	4	U	ug/L	4	6
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Methyl isobutyl ketone	3.2	U	ug/L	3.2	5
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Methyl tert-butyl ether (MTBE)	0.8	U	ug/L	0.8	5
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Methylene chloride	2	U	ug/L	2	5
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	N-Butylbenzene	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	N-Propylbenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	p-Chlorotoluene	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	sec-Butylbenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Styrene	0.8	U	ug/L	0.8	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	tert-Butylbenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Tetrachloroethene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Toluene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	trans-1,2-Dichloroethene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	trans-1,3-Dichloropropene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Trichloroethene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Trichlorofluoromethane (Freon 11)	0.8	U	ug/L	0.8	2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Vinyl chloride	0.2	U	ug/L	0.2	1.5
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Xylene, m,p-	0.8	U	ug/L	0.8	2
AOC_GW_NBP	JAW-13	JAW-13-0319	WG	3/24/2019	7	17	Xylene, o-	0.4	U	ug/L	0.4	1
AOC_GW_NBP	JAW-13	JAW-13-20020614	WG	6/14/2002	7	17	Arsenic	10	U	ug/L	10	
AOC_GW_NBP	JAW-13	JAW-13-20020614	WG	6/14/2002	7	17	Barium	86.2	J	ug/L		
AOC_GW_NBP	JAW-13	JAW-13-20020614	WG	6/14/2002	7	17	Cadmium	5	U	ug/L	5	
AOC_GW_NBP	JAW-13	JAW-13-20020614	WG	6/14/2002	7	17	Chromium	1.7	J	ug/L		
AOC_GW_NBP	JAW-13	JAW-13-20020614	WG	6/14/2002	7	17	Lead	10	U	ug/L	10	
AOC_GW_NBP	JAW-13	JAW-13-20020614	WG	6/14/2002	7	17	Mercury	0.2	U	ug/L	0.2	
AOC_GW_NBP	JAW-13	JAW-13-20020614	WG	6/14/2002	7	17	Selenium	1.6	J	ug/L		
AOC_GW_NBP	JAW-13	JAW-13-20020614	WG	6/14/2002	7	17	Silver	10	U	ug/L	10	
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	1,3,5-Trinitrobenzene	0.4	U	ug/L	0.4	0.99
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	1,3-Dinitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	2,4,6-Trinitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	2,4-Dinitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	2,6-Dinitrotoluene	0.2	U	ug/L	0.2	0.2
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	2-Amino-4,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	2-Nitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	3-Nitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	4-Amino-2,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	4-Nitrotoluene	0.4	U	ug/L	0.4	0.99
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	DNX	0.25	U	ug/L	0.25	0.5
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	HMX	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	MNX	0.29	U	ug/L	0.29	0.5
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	Nitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	RDX	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	Tetryl	0.2	U	ug/L	0.2	0.24
AOC_GW_NBP	JAW-14	JAW-14-0319	WG	3/24/2019	18	28	TNX	0.25	U	ug/L	0.25	0.5
AOC_GW_NBP	JAW-14	JAW-14-20020614	WG	6/14/2002	18	28	Arsenic	10	U	ug/L	10	
AOC_GW_NBP	JAW-14	JAW-14-20020614	WG	6/14/2002	18	28	Barium	184	J	ug/L		
AOC_GW_NBP	JAW-14	JAW-14-20020614	WG	6/14/2002	18	28	Cadmium	5	U	ug/L	5	
AOC_GW_NBP	JAW-14	JAW-14-20020614	WG	6/14/2002	18	28	Chromium	0.62	J	ug/L		

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, North Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBP	JAW-14	JAW-14-20020614	WG	6/14/2002	18	28	Lead	1.7	J	ug/L		
AOC_GW_NBP	JAW-14	JAW-14-20020614	WG	6/14/2002	18	28	Mercury	0.2	U	ug/L	0.2	
AOC_GW_NBP	JAW-14	JAW-14-20020614	WG	6/14/2002	18	28	Selenium	1.8	J	ug/L		
AOC_GW_NBP	JAW-14	JAW-14-20020614	WG	6/14/2002	18	28	Silver	10	U	ug/L	10	
AOC_GW_NBP	JAW-14	JAW-14-20031119	WG	11/19/2003	18	28	Arsenic	10	U	ug/L	10	
AOC_GW_NBP	JAW-14	JAW-14-20031119	WG	11/19/2003	18	28	Barium	181	J	ug/L		
AOC_GW_NBP	JAW-14	JAW-14-20031119	WG	11/19/2003	18	28	Cadmium	5	U	ug/L	5	
AOC_GW_NBP	JAW-14	JAW-14-20031119	WG	11/19/2003	18	28	Chromium	0.9	J	ug/L		
AOC_GW_NBP	JAW-14	JAW-14-20031119	WG	11/19/2003	18	28	Lead	10	U	ug/L	10	
AOC_GW_NBP	JAW-14	JAW-14-20031119	WG	11/19/2003	18	28	Mercury	0.2	U	ug/L	0.2	
AOC_GW_NBP	JAW-14	JAW-14-20031119	WG	11/19/2003	18	28	Selenium	10	U	ug/L	10	
AOC_GW_NBP	JAW-14	JAW-14-20031119	WG	11/19/2003	18	28	Silver	10	U	ug/L	10	
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	1,3,5-Trinitrobenzene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	1,3-Dinitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2,4,6-Trinitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2,4-Dinitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2,6-Dinitrotoluene	0.2	U	ug/L	0.2	0.2
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2-Amino-4,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2-Nitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	3-Nitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	4-Amino-2,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	4-Nitrotoluene	0.4	U	ug/L	0.4	1
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	DNX	0.25	U	ug/L	0.25	0.5
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	HMX	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	MNX	0.1	J	ug/L	0.093	0.5
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	Nitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	RDX	0.4	U	ug/L	0.4	0.4
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	Tetryl	0.2	U	ug/L	0.2	0.24
AOC_GW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	TNX	0.25	U	ug/L	0.25	0.5
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	1,3,5-Trinitrobenzene	0.4	U	ug/L	0.4	1
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	1,3-Dinitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2,4,6-Trinitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2,4-Dinitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2,6-Dinitrotoluene	0.2	U	ug/L	0.2	0.2
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2-Amino-4,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	2-Nitrotoluene	0.2	UJ	ug/L	0.2	0.4
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	3-Nitrotoluene	0.4	UJ	ug/L	0.4	0.4
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	4-Amino-2,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	4-Nitrotoluene	0.4	U	ug/L	0.4	1
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	DNX	0.25	U	ug/L	0.25	0.5
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	HMX	0.088	J	ug/L	0.088	0.4
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	MNX	0.29	U	ug/L	0.29	0.5
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	Nitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	RDX	0.4	U	ug/L	0.4	0.4
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	Tetryl	0.2	U	ug/L	0.2	0.24
AOC_GW-CW_NBP	JAW-11	JAW-11-0319	WG	3/24/2019	19	29	TNX	0.25	U	ug/L	0.25	0.5
AOC_GW-CW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Arsenic	10	U	ug/L	10	
AOC_GW-CW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Barium	70.3	J	ug/L		
AOC_GW-CW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Cadmium	5	U	ug/L	5	
AOC_GW-CW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Chromium	10	U	ug/L	10	
AOC_GW-CW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Lead	10	U	ug/L	10	
AOC_GW-CW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Mercury	0.2	U	ug/L	0.2	
AOC_GW-CW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Selenium	10	U	ug/L	10	
AOC_GW-CW_NBP	JAW-11	JAW-11-20020613	WG	6/13/2002	19	29	Silver	10	U	ug/L	10	
AOC_GW-CW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Arsenic	10	U	ug/L	10	
AOC_GW-CW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Barium	89.6	J	ug/L		
AOC_GW-CW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Cadmium	5	U	ug/L	5	

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, North Burn Pads, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Chromium	2.4	J	ug/L		
AOC_GW-CW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Lead	10	U	ug/L	10	
AOC_GW-CW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Mercury	0.2	U	ug/L	0.2	
AOC_GW-CW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Selenium	10	U	ug/L	10	
AOC_GW-CW_NBP	JAW-11	JAW-11-20031119	WG	11/19/2003	19	29	Silver	10	U	ug/L	10	
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	1,3,5-Trinitrobenzene	0.4	U	ug/L	0.4	1
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	1,3-Dinitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2,4,6-Trinitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2,4-Dinitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2,6-Dinitrotoluene	0.2	U	ug/L	0.2	0.2
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2-Amino-4,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	2-Nitrotoluene	0.2	U	ug/L	0.2	0.4
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	3-Nitrotoluene	0.4	U	ug/L	0.4	0.4
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	4-Amino-2,6-dinitrotoluene	0.12	U	ug/L	0.12	0.2
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	4-Nitrotoluene	0.4	U	ug/L	0.4	1
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	DNX	0.25	U	ug/L	0.25	0.5
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	HMX	0.2	U	ug/L	0.2	0.4
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	MNX	0.1	J	ug/L	0.093	0.5
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	Nitrobenzene	0.2	U	ug/L	0.2	0.4
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	RDX	0.4	U	ug/L	0.4	0.4
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	Tetryl	0.2	U	ug/L	0.2	0.24
AOC_GW-CW_NBP	NBP-MW1	NBP-MW1-0319	WG	3/24/2019	15	25	TNX	0.25	U	ug/L	0.25	0.5

Notes:
(1) The data were reduced such that when a normal and duplicate sample were available, the highest detected concentration among normal or duplicate samples was used when a chemical was detected in any sample. If both results were non-detect, the lowest reported detection limit (i.e., reporting limit) was used.
NA = Not available
WG - groundwater
J - compound was detected below the reporting limit in the sample
= - detected
U - not detected
µg/L - microgram per liter

ATTACHMENT 3

Non-detected Data Analysis: North Burn Pads

Chemicals that were 100 percent non-detected (ND) in a groundwater data grouping were not identified as COPCs for that data grouping; however, a qualitative evaluation of the 100 percent (%) ND chemicals within the North Burn Pads (NBP) groundwater was conducted.

Detection limits (DLs) and reporting limits (RLs) for chemicals that were 100 % ND were compared to groundwater screening levels (SLs). Groundwater SLs are the USEPA Regional Screening levels (RSLs) for tap water (USEPA, 2023) using an excess lifetime cancer risk (ELCR) of 1×10^{-6} and a hazard quotient (HQ) of 1. The NBP ND chemicals and a comparison of the ND DLs and RLs to SLs is provided in Attachment 3, Table 1. ND chemicals exceeding SLs are identified and discussed below with regard to the frequency of exceedance, suitability of the DLs and RLs, and potential to be related to former site activities.

Non-detected Chemicals Exceeding Screening Levels

Four explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene), two metals (arsenic and cadmium), one polycyclic aromatic hydrocarbon ([PAH], naphthalene), 2 semi-volatile organic compounds ([SVOCs] 1,4-dichlorobenzene and hexachlorobutadiene), and 14 volatile organic compounds (VOCs) have RLs and/or DLs exceeding SLs at the NBP. The ND metals dataset did not include RLs. However, 2 explosives (2,4-dinitrotoluene and 2-nitrotoluene), one SVOC (1,4-dichlorobenzene), and 5 VOCs (1,2-dichloropropane, benzene, dibromochloromethane, carbon tetrachloride and trichloroethene) had RLs that were greater than SLs but no DLs greater than SLs. Explosives with RLs and/or DLs greater than SLs had a dataset of 5 samples per explosive, while metals, SVOCs and VOCs with RLs and/or DLs greater than SLs were analyzed in one sample per analyte.

Two explosives (DNX and TNX), 1 SVOC (1,3-dichlorobenzene) and 4 VOCs (1,1-dichloropropene, 1-chlorohexane, 2,2-dichloropropane, and 4-isopropyltoluene) were consistently ND in the NBP data set, but SLs were not available for these ND chemicals. Therefore, those ND chemicals were not included in the ND assessment process.

Non-detected Chemicals Related to Former Site Activities

To determine whether ND chemicals exceeding SLs could potentially be related to former site activities, the historical IAAAP facility-wide dataset for the non-Formerly Utilized Sites Remedial Action Program (FUSRAP) sites was evaluated, and results are provided in Attachment 3, Table 2. The ND comparison included historically detected chemicals in all media; however, surface water and sediment are not being evaluated in the NBP HHRA and soil is being addressed under the Operable Unit 1 Remedial Action.

- **ND Explosives**: 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene have been historically detected in groundwater, soil and surface water at IAAAP, and with the exception of 2-nitrotoluene, all have been historically detected in sediment at IAAAP.

  It is noted that DLs (maximum and minimum DLs equal to 0.2 ug/L) and RLs (ranging from 0.2 to 0.4 ug/L) for the 4 explosives with DLs and/or RLs greater than SLs are acceptably low for an explosives analysis. Additionally, when compared to the other ND explosives with DLs and RLs less than SLs, the SLs for the 4 ND explosives with DLs and RLs greater than SLs also have the lowest SLs for all the ND explosives. As a result, it is highly probable that the ND explosives with

DLs and/or RLs greater than SLs are due to the relatively higher toxicity of these 4 explosives in comparison to the other analyzed ND explosives, and it is unlikely that any of the ND explosives are present in site groundwater.

- **ND Metals:** Arsenic and cadmium have been historically detected in all media (groundwater, soil, surface water and sediment) at IAAAP. The maximum DL for arsenic is 10 ug/L, which is equivalent to the MCL as reported in the RSL Table (USEPA, 2023). As a result, even if the ND arsenic results were to be assessed in the HHRA, since the maximum DL is equivalent to the MCL, arsenic would not be identified as a constituent of concern (COC) in groundwater. Similarly, the cadmium DL of 5 ug/L for all 6 ND results is equivalent to the MCL of 5 ug/L. As a result, even if the ND cadmium results were to be assessed in the HHRA, since the maximum DL is equivalent to the MCL, cadmium would not be identified as a COC in groundwater.

- **ND PAHs and SVOCs**: The one PAH (naphthalene) with DLs and RLs greater than the SL has been historically detected in groundwater, soil and sediment at IAAAP. The two SVOCs (1,4-dichlorobenzene and hexachlorobutadiene) with DLs and/or RLs greater than SLs have only been historically detected in soil at IAAAP.

  As shown on Attachment 1, Table 2.1, none of the detected chemicals in groundwater at the NBP were PAHs or SVOCs. The maximum DLs for naphthalene, 1,4-dichlorobenzene and hexachlorobutadiene are less than 1 ug/L and the maximum RLs are all equivalent to 1 ug/L, which are acceptably low DLs and RLs for PAH/SVOC analysis, and the 1,4-dichlorobenzene maximum DL is less than the SL. Based on acceptably low RLs and DLs and the fact that no PAHs or SVOCs were detected in the NBP groundwater dataset, it is highly unlikely that naphthalene, 1,4-dichlorobenzene or hexachlorobutadiene are present in site groundwater.

- **ND VOCs**: Of the 14 VOCs with DLs and/or RLs greater than SLs, 9 have been historically detected in groundwater at IAAAP, 4 have been historically detected in soil at IAAAP, 6 have been historically detected in surface water at IAAAP, and one has been historically detected in sediment at IAAAP.

  Although 3 VOCs were detected in the groundwater data set (Attachment 1, Table 2.1), only one VOC was detected above the SL (Freon 113), and the two other detected VOCs (bromomethane and chloroform) that were detected at concentrations less than SLs had relatively low DLs of 0.21 ug/L (bromomethane) and 0.16 ug/L (chloroform). Of the 14 ND VOCs with RLs greater than SLs, the maximum RL was 5 ug/L, with the majority of RLs being 1 ug/L. Of the 9 ND VOCs with DLs greater than SLs, the maximum DL was 1.6 ug/L (1,2-dibromo-3-chloropropane), with the 8 other VOCs having maximum DLs less than 1 ug/L. Despite the relatively elevated detection of Freon 113, there is no indication that the Freon 113 detection caused interference with other VOC DLs or RLs based on the acceptably low DLs and RLs of the other detected VOCs and the ND VOCs. As a result, ND VOCs with DLs and/or RLs greater than SLs is likely the result of the higher toxicity/lower SLs associated with the ND VOCs, and it is highly unlikely that any of the ND VOCs with RLs and/or DLs greater than SLs are present in site groundwater.

Conclusions

Four explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene), two metals (arsenic and cadmium), one PAH (naphthalene), 2 SVOCs (1,4-dichlorobenzene and hexachlorobutadiene), and 14 VOCs have RLs and/or DLs exceeding SLs at the NBP. Although the DLs and/or RLs for these ND chemicals are greater than the SLs, based on acceptably low DLs and RLs, further consideration of ND chemicals does not appear warranted in the NBP HHRA.

References

USEPA. 2023. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* May.

ATTACHMENT 3, TABLE 1
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, North Burn Pads, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
Explosives	99-35-4	1,3,5-Trinitrobenzene	ug/L	0 / 5	0.39	0.4	0.99	1	590	0	0
Explosives	99-65-0	1,3-Dinitrobenzene	ug/L	0 / 5	0.2	0.2	0.39	0.4	2	0	0
Explosives	118-96-7	2,4,6-Trinitrotoluene	ug/L	0 / 5	0.39	0.4	0.39	0.4	2.5	0	0
Explosives	121-14-2	2,4-Dinitrotoluene	ug/L	0 / 5	0.2	0.2	0.39	0.4	0.24	0	5
Explosives	606-20-2	2,6-Dinitrotoluene	ug/L	0 / 5	0.2	0.2	0.2	0.2	0.049	5	5
Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	ug/L	0 / 5	0.12	0.12	0.2	0.2	1.9	0	0
Explosives	88-72-2	2-Nitrotoluene	ug/L	0 / 5	0.2	0.2	0.39	0.4	0.31	0	5
Explosives	99-08-1	3-Nitrotoluene	ug/L	0 / 5	0.39	0.4	0.39	0.4	1.7	0	0
Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	ug/L	0 / 5	0.12	0.12	0.2	0.2	1.9	0	0
Explosives	99-99-0	4-Nitrotoluene	ug/L	0 / 5	0.39	0.4	0.99	1	4.3	0	0
Explosives	DNX	DNX	ug/L	0 / 5	0.25	0.25	0.49	0.5	--	--	--
Explosives	98-95-3	Nitrobenzene	ug/L	0 / 5	0.2	0.2	0.39	0.4	0.14	5	5
Explosives	121-82-4	RDX	ug/L	0 / 5	0.39	0.4	0.39	0.4	0.97	0	0
Explosives	479-45-8	Tetryl	ug/L	0 / 5	0.2	0.2	0.24	0.24	39	0	0
Explosives	13980-04-6	TNX	ug/L	0 / 5	0.25	0.25	0.49	0.5	--	--	--
Metals	7440-38-2	Arsenic	ug/L	0 / 6	10	10	--	--	0.052	6	--
Metals	7440-43-9	Cadmium	ug/L	0 / 6	5	5	--	--	1.8	6	--
Metals	7439-97-6	Mercury	ug/L	0 / 6	0.2	0.2	--	--	0.63	0	--
Metals	7440-22-4	Silver	ug/L	0 / 6	10	10	--	--	94	0	--
PAHs	91-20-3	Naphthalene	ug/L	0 / 1	0.8	0.8	1	1	0.12	1	1
SVOCs	120-82-1	1,2,4-Trichlorobenzene	ug/L	0 / 1	0.8	0.8	1	1	1.2	0	0
SVOCs	95-50-1	1,2-Dichlorobenzene	ug/L	0 / 1	0.4	0.4	1	1	300	0	0
SVOCs	541-73-1	1,3-Dichlorobenzene	ug/L	0 / 1	0.4	0.4	1	1	--	--	--
SVOCs	106-46-7	1,4-Dichlorobenzene	ug/L	0 / 1	0.4	0.4	1	1	0.48	0	1
SVOCs	87-68-3	Hexachlorobutadiene	ug/L	0 / 1	0.8	0.8	1	1	0.14	1	1
VOCs	630-20-6	1,1,1,2-Tetrachloroethane	ug/L	0 / 1	0.8	0.8	1	1	0.57	1	1
VOCs	71-55-6	1,1,1-Trichloroethane	ug/L	0 / 1	0.4	0.4	1	1	8000	0	0
VOCs	79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0 / 1	0.8	0.8	1	1	0.076	1	1
VOCs	79-00-5	1,1,2-Trichloroethane	ug/L	0 / 1	0.8	0.8	1	1	0.28	1	1
VOCs	75-34-3	1,1-Dichloroethane	ug/L	0 / 1	0.8	0.8	1	1	2.8	0	0
VOCs	75-35-4	1,1-Dichloroethene	ug/L	0 / 1	0.8	0.8	1	1	280	0	0
VOCs	563-58-6	1,1-Dichloropropene	ug/L	0 / 1	0.4	0.4	1	1	--	--	--
VOCs	87-61-6	1,2,3-Trichlorobenzene	ug/L	0 / 1	0.8	0.8	1	1	7	0	0
VOCs	96-18-4	1,2,3-Trichloropropane	ug/L	0 / 1	0.8	0.8	3	3	0.00075	1	1
VOCs	95-63-6	1,2,4-Trimethylbenzene	ug/L	0 / 1	0.4	0.4	1	1	56	0	0
VOCs	96-12-8	1,2-Dibromo-3-chloropropane	ug/L	0 / 1	1.6	1.6	5	5	0.00033	1	1
VOCs	106-93-4	1,2-Dibromoethane	ug/L	0 / 1	0.4	0.4	1	1	0.0075	1	1
VOCs	107-06-2	1,2-Dichloroethane	ug/L	0 / 1	0.4	0.4	1	1	0.17	1	1
VOCs	78-87-5	1,2-Dichloropropane	ug/L	0 / 1	0.4	0.4	1	1	0.85	0	1
VOCs	108-67-8	1,3,5-Trimethylbenzene	ug/L	0 / 1	0.4	0.4	1	1	60	0	0
VOCs	142-28-9	1,3-Dichloropropane	ug/L	0 / 1	0.2	0.2	1	1	370	0	0
VOCs	544-10-5	1-Chlorohexane	ug/L	0 / 1	0.4	0.4	1	1	--	--	--
VOCs	594-20-7	2,2-Dichloropropane	ug/L	0 / 1	0.8	0.8	1	1	--	--	--
VOCs	95-49-8	2-Chlorotoluene	ug/L	0 / 1	0.4	0.4	1	1	240	0	0
VOCs	591-78-6	2-Hexanone	ug/L	0 / 1	4	4	5	5	38	0	0
VOCs	99-87-6	4-Isopropyltoluene	ug/L	0 / 1	0.4	0.4	1	1	--	--	--
VOCs	67-64-1	Acetone	ug/L	0 / 1	6.4	6.4	10	10	18000	0	0
VOCs	71-43-2	Benzene	ug/L	0 / 1	0.4	0.4	1	1	0.46	0	1
VOCs	108-86-1	Bromobenzene	ug/L	0 / 1	0.4	0.4	1	1	62	0	0
VOCs	74-97-5	Bromochloromethane	ug/L	0 / 1	0.2	0.2	1	1	83	0	0
VOCs	75-27-4	Bromodichloromethane	ug/L	0 / 1	0.4	0.4	1	1	0.13	1	1

ATTACHMENT 3, TABLE 1
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, North Burn Pads, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
VOCs	75-25-2	Bromoform	ug/L	0 / 1	1	1	1	1	3.3	0	0
VOCs	75-15-0	Carbon disulfide	ug/L	0 / 1	0.8	0.8	2	2	810	0	0
VOCs	56-23-5	Carbon tetrachloride	ug/L	0 / 1	0.4	0.4	2	2	0.46	0	1
VOCs	74-87-3	Chloro methane	ug/L	0 / 1	0.8	0.8	2	2	190	0	0
VOCs	108-90-7	Chlorobenzene	ug/L	0 / 1	0.4	0.4	1	1	78	0	0
VOCs	75-00-3	Chloroethane	ug/L	0 / 1	1.6	1.6	2	2	8300	0	0
VOCs	156-59-2	cis-1,2-Dichloroethene	ug/L	0 / 1	0.4	0.4	1	1	25	0	0
VOCs	10061-01-5	cis-1,3-Dichloropropene	ug/L	0 / 1	0.4	0.4	1	1	0.47	0	0
VOCs	124-48-1	Dibromochloromethane	ug/L	0 / 1	0.4	0.4	1	1	0.87	0	1
VOCs	74-95-3	Dibromomethane	ug/L	0 / 1	0.4	0.4	1	1	8.3	0	0
VOCs	75-71-8	Dichlorodifluoromethane	ug/L	0 / 1	0.8	0.8	2	2	200	0	0
VOCs	100-41-4	Ethyl- benzene	ug/L	0 / 1	0.4	0.4	1	1	1.5	0	0
VOCs	98-82-8	Isopropylbenzene	ug/L	0 / 1	0.4	0.4	1	1	450	0	0
VOCs	78-93-3	Methyl ethyl ketone	ug/L	0 / 1	4	4	6	6	5600	0	0
VOCs	108-10-1	Methyl isobutyl ketone	ug/L	0 / 1	3.2	3.2	5	5	6300	0	0
VOCs	1634-04-4	Methyl tert-butyl ether (MTBE)	ug/L	0 / 1	0.8	0.8	5	5	14	0	0
VOCs	75-09-2	Methylene chloride	ug/L	0 / 1	2	2	5	5	11	0	0
VOCs	104-51-8	N-Butylbenzene	ug/L	0 / 1	0.8	0.8	1	1	1000	0	0
VOCs	103-65-1	N-Propylbenzene	ug/L	0 / 1	0.4	0.4	1	1	660	0	0
VOCs	106-43-4	p-Chlorotoluene	ug/L	0 / 1	0.8	0.8	1	1	250	0	0
VOCs	135-98-8	sec-Butylbenzene	ug/L	0 / 1	0.4	0.4	1	1	2000	0	0
VOCs	100-42-5	Styrene	ug/L	0 / 1	0.8	0.8	1	1	1200	0	0
VOCs	98-06-6	tert-Butylbenzene	ug/L	0 / 1	0.4	0.4	1	1	690	0	0
VOCs	127-18-4	Tetrachloroethene	ug/L	0 / 1	0.4	0.4	1	1	11	0	0
VOCs	108-88-3	Toluene	ug/L	0 / 1	0.4	0.4	1	1	1100	0	0
VOCs	156-60-5	trans-1,2-Dichloroethene	ug/L	0 / 1	0.4	0.4	1	1	68	0	0
VOCs	10061-02-6	trans-1,3-Dichloropropene	ug/L	0 / 1	0.4	0.4	1	1	0.47	0	0
VOCs	79-01-6	Trichloroethene	ug/L	0 / 1	0.4	0.4	1	1	0.49	0	1
VOCs	75-69-4	Trichlorofluoromethane (Freon 11)	ug/L	0 / 1	0.8	0.8	2	2	5200	0	0
VOCs	75-01-4	Vinyl chloride	ug/L	0 / 1	0.2	0.2	1.5	1.5	0.019	1	1
VOCs	XYLMP	Xylene, m,p-	ug/L	0 / 1	0.8	0.8	2	2	190	0	0
VOCs	95-47-6	Xylene, o-	ug/L	0 / 1	0.4	0.4	1	1	190	0	0

Notes:
(1) Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2023) - Tapwater. Concentrations based on non-carcinogenic health effects are based on HQ=1; carcinogenic effects are based on risk of 1E-06. Available: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
1,3-Dichloropropene was used as a surrogate for cis-1,3-Dichloropropene
1,3-Dichloropropene was used as a surrogate for trans-1,3-Dichloropropene
Xylenes, total was used as a surrogate for Xylene, m,p-
[2] The maximum detection limit and reporting limit were compared to the screening level.

FOD = frequency of detect
ug/L = microgram per liter
NA = not available

ATTACHMENT 3, TABLE 2
Historically Detected Chemicals at IAAAP
Iowa Army Ammunition Plant, North Burn Pads, Middletown, Iowa

100% ND Chemical > SL	Detected in Groundwater	Detected in soil	Detected in Surface Water	Detected in Sediment
2,4-Dinitrotoluene	X	X	X	X
2,6-Dinitrotoluene	X	X	X	X
2-Nitrotoluene	X	X	X	--
Nitrobenzene	X	X	X	X
Arsenic	X	X	X	X
Cadmium	X	X	X	X
Naphthalene	X	X	--	X
1,4-Dichlorobenzene	--	X	--	--
Hexachlorobutadiene	--	X	--	--
1,1,1,2-Tetrachloroethane	--	--	--	--
1,1,2,2-Tetrachloroethane	X	X	--	X
1,1,2-Trichloroethane	X	--	--	--
1,2,3-Trichloropropane	--	--	--	--
1,2-Dibromo-3-chloropropane	--	--	--	--
1,2-Dibromoethane	--	--	--	--
1,2-Dichloroethane	X	--	X	--
1,2-Dichloropropane	X	X	--	--
Benzene	X	X	X	--
Bromodichloromethane	X	--	X	--
Carbon tetrachloride	X	--	X	--
Dibromochloromethane	--	--	--	--
Trichloroethene	X	X	X	--
Vinyl chloride	X	--	X	--

X = chemical was historically detected
-- = chemical was not historically detected.

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Soil	Soil	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion, Inhalation	On-site	None	The North Burn Pads Landfill is open to recreational use; therefore, hunting is permitted at the site. However, soil is addressed under OU1 with land use controls for industrial land use.
	Surface Water/Sediment	Surface Water/Sediment	Drainage Ditches	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion	On-site	None	The North Burn Pads Landfill is open to recreational use; therefore, hunting is permitted at the site. However, there are no waterbodies within the North Burn Pads Landfill; thus, surface water and sediment were not evaluated in the HHRA.
	Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Site Worker [1]	Adult	Inhalation	On-site	None	There are no detected volatile organic compounds in groundwater; therefore, this pathway is incomplete.
Future	Soil	Soil	Soil	Site Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	Soil is addressed under OU1 with land use controls for industrial land use.
				Construction/ Utility Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	
				Hypothetical Resident	Adult, Child	Dermal, Ingestion, Inhalation	On-site	None	
	Groundwater[3]	Tapwater	Tapwater	Site Worker	Adult	Dermal, Ingestion	On-site	Quant [2]	Future site workers could use groundwater as a potable water source. Site workers could ingest drinking water and could have dermal contact with groundwater while hand washing.
				Hypothetical Resident	Adult, Child	Dermal, Ingestion	On-site	Quant	Future hypothetical residents could use groundwater as a potable water source. Residents could ingest drinking water and could have dermal contact with groundwater while showering.
		Household Air (Domestic Use)	Vapors in House (Domestic Use)	Hypothetical Resident	Adult, Child	Inhalation	On-site	None	There are no detected volatile organic compounds in groundwater; therefore, this pathway is incomplete.
		Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Hypothetical Resident	Adult, Child	Inhalation	On-Site	None	There are no detected volatile organic compounds in groundwater; therefore, this pathway is incomplete.
	Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Construction/ Utility Worker	Adult	Dermal, Ingestion	On-site	None	There are no culverts within the North Burn Pads Landfill.
		Trench Air	Vapors in a Trench	Construction/ Utility Worker	Adult	Inhalation	On-site	None	There are no culverts within the North Burn Pads Landfill.

Notes:
Quant: Quantitative evaluation

(1) The North Burn Pads Landfill in currently inactive, however, there is a building on site that is in use by staff members as a break room.
(2) Potential exposures to groundwater are only estimated for a site worker if the estimated risks for a hypothetical residential scenario exceed acceptable risk levels and COCs are identified for a residential scenario.
(3) Groundwater is not currently being used as a potable water source and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the North Burn Pads Landfill is classified as Class IIB, a potential source of drinking water. Therefore, the HHRA evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This requires the evaluation of future residential exposures to groundwater.

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater/Household Air (Domestic Use)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
Tapwater/ Vapors in House (Domestic Use) North Burn Pads Landfill	2691-41-0	HMX	1.0E+00		7.9E+00		ug/L	JAW-627	4 / 7	0.1 - 0.21	7.9E+00	NA	1.0E+02	nc	4.0E+02	LHA	No	BSL
	5755-27-1	MNX	1.4E-01	J	1.6E+00	J	ug/L	NBPLF-MW6	2 / 7	0.099 - 0.29	1.6E+00	NA	NTX		NA	NA	No	NTX
	121-82-4	RDX	2.7E-01		1.4E+01		ug/L	JAW-627	4 / 7	0.1 - 20	1.4E+01	NA	9.7E-01	ca	2.0E+00	LHA	Yes	ASL
	7429-90-5	Aluminum	3.4E+01	B	3.4E+01	B	ug/L	JAW-626	1 / 1	-	3.4E+01	1.1E+04	2.0E+03	nc	NA	NA	No	BSL
	7440-36-0	Antimony	4.1E+00	B	4.1E+00	B	ug/L	JAW-626	1 / 1	-	4.1E+00	2.2E+00	7.8E-01	nc	6.0E+00	MCL	Yes	ASL
	7440-39-3	Barium	6.8E+01		2.5E+02		ug/L	JAW-626	5 / 5	-	2.5E+02	4.3E+02	3.8E+02	nc	2.0E+03	MCL	No	BSL
	7440-43-9	Cadmium	5.6E-01	B	9.3E-01		ug/L	JAW-625	3 / 5	0.48 - 5	9.3E-01	5.0E+00	1.8E-01	nc	5.0E+00	MCL	Yes	ASL
	7440-70-2	Calcium	8.4E+04		8.4E+04		ug/L	JAW-626	1 / 1	-	8.4E+04	1.2E+05	NUT		NA	NA	No	NUT
	7440-47-3	Chromium	1.0E+00	B	5.2E+00		ug/L	JAW-625	5 / 5	-	5.2E+00	3.1E+01	3.5E-02	ca	NA	NA	Yes	ASL
	7440-50-8	Copper	2.2E+00	B	2.2E+00	B	ug/L	JAW-626	1 / 1	-	2.2E+00	1.6E+01	8.0E+01	nc	1.3E+03	MCL	No	BSL
	7439-92-1	Lead	3.0E-01		5.8E+00		ug/L	JAW-625	2 / 5	10 - 10	5.8E+00	1.8E+01	1.5E+01	L	1.5E+01	MCL	No	BSL
	7439-95-4	Magnesium	3.6E+04		3.6E+04		ug/L	JAW-626	1 / 1	-	3.6E+04	4.5E+04	NUT		NA	NA	No	NUT
	7439-96-5	Manganese	6.7E+00	B	6.7E+00	B	ug/L	JAW-626	1 / 1	-	6.7E+00	5.8E+02	4.3E+01	nc	NA	NA	No	BSL
	7439-97-6	Mercury	3.0E-02		6.0E-02		ug/L	JAW-625	2 / 5	0.2 - 0.2	6.0E-02	1.0E+00	5.7E-01	n	2.0E+00	MCL	No	BSL
	7440-02-0	Nickel	2.7E+00	B	2.7E+00	B	ug/L	JAW-626	1 / 1	-	2.7E+00	5.1E+01	3.9E+01	nc	1.0E+02	LHA	No	BSL
	7440-09-7	Potassium	2.9E+03	BE	2.9E+03	BE	ug/L	JAW-626	1 / 1	-	2.9E+03	2.5E+03	NUT		NA	NA	No	NUT
	7782-49-2	Selenium	1.3E+00		1.3E+00		ug/L	JAW-625	1 / 5	1.2 - 10	1.3E+00	1.0E+01	1.0E+01	nc	5.0E+01	MCL	No	BSL
	7440-22-4	Silver	4.5E-01	B	5.4E-01	J	ug/L	JAW-627	2 / 5	0.32 - 10	5.4E-01	1.0E+01	9.4E+00	nc	1.0E+02	LHA	No	BSL
	7440-23-5	Sodium	3.2E+04	E	3.2E+04	E	ug/L	JAW-626	1 / 1	-	3.2E+04	4.3E+04	NUT		NA	NA	No	NUT
	7440-62-2	Vanadium	3.4E-01	B	3.4E-01	B	ug/L	JAW-626	1 / 1	-	3.4E-01	1.5E+01	8.6E+00	nc	NA	NA	No	BSL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Regional Screening Levels (RSL) for Tap Water (May 2023). Concentrations based on non-carcinogenic health effects are based on HQ=0.1.
The RSL for Chromium(VI) was used for Chromium, total.
The RSL for Mercuric Chloride was used for Mercury.

(4) Values are the Federal Maximum Contaminant Levels (MCLs) and if no MCL was available, the EPA's (March 2018) Office of Water Lifetime Health Advisory (LHA) was provided.

(5) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
No Toxicity Value Available (NTX)
Essential Nutrient (NUT)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
B = Inorganic, metals results detected below the RL. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
ca = carcinogenic
COPC = Chemical of Potential Concern
E = Sample result over the calibration range, considered an estimated result.
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
L = lead action level
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
nc = noncarcinogenic
RDX = Royal Demolition Explosive
μg/L= microgram per liter

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Indoor Air (Vapor Intrusion) North Burn Pads Landfill	2691-41-0	HMX	1.0E+00		7.9E+00		ug/L	JAW-627	4 / 7	0.1 - 0.21	7.9E+00	NA	NSV	NA	NA	No	NSV
	5755-27-1	MNX	1.4E-01	J	1.6E+00	J	ug/L	NBPLF-MW6	2 / 7	0.099 - 0.29	1.6E+00	NA	NTX	NA	NA	No	NTX
	121-82-4	RDX	2.7E-01		1.4E+01		ug/L	JAW-627	4 / 7	0.1 - 20	1.4E+01	NA	NSV	NA	NA	No	NSV
	7429-90-5	Aluminum	3.4E+01	B	3.4E+01	B	ug/L	JAW-626	1 / 1	-	3.4E+01	1.1E+04	NSV	NA	NA	No	NSV
	7440-36-0	Antimony	4.1E+00	B	4.1E+00	B	ug/L	JAW-626	1 / 1	-	4.1E+00	2.2E+00	NSV	NA	NA	No	NSV
	7440-39-3	Barium	6.8E+01		2.5E+02		ug/L	JAW-626	5 / 5	-	2.5E+02	4.3E+02	NSV	NA	NA	No	NSV
	7440-43-9	Cadmium	5.6E-01	B	9.3E-01		ug/L	JAW-625	3 / 5	0.48 - 5	9.3E-01	5.0E+00	NSV	NA	NA	No	NSV
	7440-70-2	Calcium	8.4E+04		8.4E+04		ug/L	JAW-626	1 / 1	-	8.4E+04	1.2E+05	NSV	NA	NA	No	NSV
	7440-47-3	Chromium	1.0E+00	B	5.2E+00		ug/L	JAW-625	5 / 5	-	5.2E+00	3.1E+01	NSV	NA	NA	No	NSV
	7440-50-8	Copper	2.2E+00	B	2.2E+00	B	ug/L	JAW-626	1 / 1	-	2.2E+00	1.6E+01	NSV	NA	NA	No	NSV
	7439-92-1	Lead	3.0E-01		5.8E+00		ug/L	JAW-625	2 / 5	10 - 10	5.8E+00	1.8E+01	NSV	NA	NA	No	NSV
	7439-95-4	Magnesium	3.6E+04		3.6E+04		ug/L	JAW-626	1 / 1	-	3.6E+04	4.5E+04	NSV	NA	NA	No	NSV
	7439-96-5	Manganese	6.7E+00	B	6.7E+00	B	ug/L	JAW-626	1 / 1	-	6.7E+00	5.8E+02	NSV	NA	NA	No	NSV
	7439-97-6	Mercury	3.0E-02		6.0E-02		ug/L	JAW-625	2 / 5	0.2 - 0.2	6.0E-02	1.0E+00	NSV	NA	NA	No	NSV
	7440-02-0	Nickel	2.7E+00	B	2.7E+00	B	ug/L	JAW-626	1 / 1	-	2.7E+00	5.1E+01	NSV	NA	NA	No	NSV
	7440-09-7	Potassium	2.9E+03	BE	2.9E+03	BE	ug/L	JAW-626	1 / 1	-	2.9E+03	2.5E+03	NSV	NA	NA	No	NSV
	7782-49-2	Selenium	1.3E+00		1.3E+00		ug/L	JAW-625	1 / 5	1.2 - 10	1.3E+00	1.0E+01	NSV	NA	NA	No	NSV
	7440-22-4	Silver	4.5E-01	B	5.4E-01	J	ug/L	JAW-627	2 / 5	0.32 - 10	5.4E-01	1.0E+01	NSV	NA	NA	No	NSV
	7440-23-5	Sodium	3.2E+04	E	3.2E+04	E	ug/L	JAW-626	1 / 1	-	3.2E+04	4.3E+04	NSV	NA	NA	No	NSV
	7440-62-2	Vanadium	3.4E-01	B	3.4E-01	B	ug/L	JAW-626	1 / 1	-	3.4E-01	1.5E+01	NSV	NA	NA	No	NSV

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Residential Groundwater Vapor Intrusion Screening Level (May 2023). Concentration based on site specific groundwater temperature of 13°C and non-carcinogenic health effects are based on HQ=0.1.

(4) Rationale Codes:

Deletion Reason: Not Sufficiently Volatile (NSV)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
B = Inorganic, metals results detected below the RL. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
µg/L= microgram per liter
COPC = Chemical of Potential Concern
E = Sample result over the calibration range, considered an estimated result.
HMX = Hot Melt Explosive
HQ = hazard quotient
J = compound was detected below the reporting limit in the sample
MNX = 1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane
NA = not available
RDX = Royal Demolition Explosive

TABLE 3.1.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale
Tapwater North Burn Pads Landfill RDX Plume	RDX	µg/L	1.4E+01	NA	1.4E+01	1.4E+01	µg/L	RDX Plume Max	1
	Antimony	µg/L	4.1E+00	NA	4.1E+00 B	4.1E+00	µg/L	Site-wide Max	1
	Cadmium	µg/L	8.0E-01	NA	9.3E-01	9.3E-01	µg/L	Site-wide Max	1
	Chromium	µg/L	2.1E+00	NA	5.2E+00	5.2E+00	µg/L	Site-wide Max	1

Notes:
* Arithmetic mean of detected concentrations are presented.
** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the RDX plume: NBPLF-MW3 and JAW-627.

Statistics:
Max: Maximum detected value

Rationale:
(1) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.

Acronyms:
B = Inorganic, metals results detected below the RL. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
EPC = Exposure Point Concentration
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	2.5	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	0.78	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				BW	Body Weight	15	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W-Adj	Ingestion Rate of Water, Age-adjusted	0.94	liter-year/kg-day	Calculated	CW x IR-W-Adj x EF x CF1 x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	IR-W-Adj (liter-year/kd-day) =
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	(ED-C x IR-W-C / BW-C) + (ED-A x IR-W-A / BW-A)
Dermal	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	19,652	cm^2	EPA, 2014	$t_{event}<t^*$: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.71	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	$t_{event}>t^*$: DAevent (mg/cm^2-event) =
				BW	Body Weight	80	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Hypothetical Resident (cont.)	Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,365	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.54	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) = DA-Adj x EF x EV x 1/AT
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	Calculated	mg-year/event-kg	Calculated	DA-Adj = (DAevent-A x SA-A x ED-A x 1/BW-A)
				EV	Event Frequency	1	events/day	EPA, 2004	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

cm/hr = Centimeter per hour
cm^2 = Square centimeter
mg/µg = Milligram per microgram
kg = Kilogram
L/cm^3 = Liter per cubic centimeter
L/day = Liter per day
mg/cm^2 -event = Milligram per square centimeter per event
mg/kg-day = Milligram per kilogram per day
µg/L = Microgram per liter

TABLE 4 RME SUPPLEMENT
RECEPTOR-SPECIFIC EXPOSURE FACTORS FOR HYPOTHETICAL RESIDENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor: Hypothetical Resident

					Water	
Age Group	**Age-dependent Adjustment Factor (ADAF)**	**Exposure Frequency (EF)**	**Exposure Duration (ED)**	**Body Weight (BW)**	**Ingestion**	**IR-W-Adj**
		(day/year)	**(years)**	**(kg)**	**(L/day)**	**(L/kg)**
Child (0-2)	10	350	2	15	0.78	364
Child (2-6)	3	350	4	15	0.78	218
Adolescent (6-16)	3	350	10	80	2.5	328
Adult (16-26)	1	350	10	80	2.5	109
Total			26			1,020

Equations
Ingestion (water): Total IR-W-Adj (MMOA) [L/kg} = Sum (ADAF x EF x ED x IR-S x 1/BW)

Sources:
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-18/259F, 2019.

MMOA - Mutagenic mode of action
ADAF - Age-dependent Adjustment Factor
kg = Kilogram
L/day = Liter per day

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD	
		Value	Units	(1)	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Antimony	Chronic	4.0E-04	mg/kg-day	15%	6.0E-05	mg/kg-day	Whole Body	1000	IRIS	09/18/2023
Cadmium (water)	Chronic	1.0E-04	mg/kg-day	5%	5.0E-06	mg/kg-day	Urinary	3	ATSDR	10/25/2022
Chromium (hexavalent)	Chronic	3.0E-03	mg/kg-day	2.5%	7.5E-05	mg/kg-day	NOE	300/3	IRIS	09/18/2023
RDX	Chronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Neurological	300	IRIS	09/18/2023

Note:
(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.
(2) Adjusted based on RAGS Part E.

Definitions:
IRIS = Integrated Risk Information System
NOE = No Observed Effects

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (hexavalent) (3)	5.0E-01	$(mg/kg\text{-}day)^{-1}$	2.5%	2.0E+01	$(mg/kg\text{-}day)^{-1}$	Cannot determine (oral)	CalEPA	09/18/2023
RDX	8.0E-02	$(mg/kg\text{-}day)^{-1}$	100%	8.0E-02	$(mg/kg\text{-}day)^{-1}$	Suggestive evidence of carcinogenic potential	IRIS	09/18/2023

Note:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral slope factor should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) This chemical operates with a mutagenic mode of action (EPA, 2005) and would exhibit a greater effect in early-life versus later-life exposure. Chemical-specific toxicity data are not available for childhood and early-life exposures; thus, EPA (2005) default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<26	1

Definitions:
Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
NA = Not Available

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	RDX	1.4E+01	µg/L	NA	NA	NA	NA	NA	4.2E-04	mg/kg/day	4.0E-03	mg/kg/day	1.0E-01
				Antimony	4.1E+00	µg/L	NA	NA	NA	NA	NA	1.2E-04	mg/kg/day	4.0E-04	mg/kg/day	3.1E-01
				Cadmium	9.3E-01	µg/L	NA	NA	NA	NA	NA	2.8E-05	mg/kg/day	1.0E-04	mg/kg/day	2.8E-01
				Chromium (hexavalent)	5.2E+00	µg/L	NA	NA	NA	NA	NA	1.6E-04	mg/kg/day	3.0E-03	mg/kg/day	5.2E-02
			Exp. Route Total								NA					7.4E-01
	Tapwater	Tapwater	Dermal	RDX	1.4E+01	µg/L	NA	NA	NA	NA	NA	3.5E-06	mg/kg/day	4.0E-03	mg/kg/day	8.8E-04
				Antimony	4.1E+00	µg/L	NA	NA	NA	NA	NA	6.9E-07	mg/kg/day	6.0E-05	mg/kg/day	1.1E-02
				Cadmium	9.3E-01	µg/L	NA	NA	NA	NA	NA	1.6E-07	mg/kg/day	5.0E-06	mg/kg/day	3.1E-02
				Chromium (hexavalent)	5.2E+00	µg/L	NA	NA	NA	NA	NA	1.7E-06	mg/kg/day	7.5E-05	mg/kg/day	2.3E-02
			Exp. Route Total								NA					6.7E-02
		Exposure Point Total									NA					8.1E-01
	Exposure Medium Total										NA					8.1E-01
Groundwater Total											NA					8.1E-01
Receptor Total											NA					8E-01

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.1.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
RDX	1.4E+01	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.71	1.5E-08	2
Antimony	4.1E+00	1.0E-03	NA	NA	NA	NA	0.71	2.9E-09	1
Cadmium	9.3E-01	1.0E-03	NA	NA	NA	NA	0.71	6.6E-10	1
Chromium (hexavalent)	5.2E+00	2.0E-03	NA	NA	NA	NA	0.71	7.4E-09	1

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater	Tapwater	Tapwater	Ingestion	RDX	1.4E+01	µg/L	NA	NA	NA	NA	NA	7.0E-04	mg/kg/day	4.0E-03	mg/kg/day	1.7E-01
				Antimony	4.1E+00	µg/L	NA	NA	NA	NA	NA	2.0E-04	mg/kg/day	4.0E-04	mg/kg/day	5.1E-01
				Cadmium	9.3E-01	µg/L	NA	NA	NA	NA	NA	4.6E-05	mg/kg/day	1.0E-04	mg/kg/day	4.6E-01
				Chromium (hexavalent)	5.2E+00	µg/L	NA	NA	NA	NA	NA	2.6E-04	mg/kg/day	3.0E-03	mg/kg/day	8.7E-02
			Exp. Route Total								NA					1.2E+00
	Tapwater	Tapwater	Dermal	RDX	1.40E+01	µg/L	NA	NA	NA	NA	NA	5.3E-06	mg/kg/day	4.0E-03	mg/kg/day	1.3E-03
				Antimony	4.10E+00	µg/L	NA	NA	NA	NA	NA	9.0E-07	mg/kg/day	6.0E-05	mg/kg/day	1.5E-02
				Cadmium	9.30E-01	µg/L	NA	NA	NA	NA	NA	2.0E-07	mg/kg/day	5.0E-06	mg/kg/day	4.1E-02
				Chromium (hexavalent)	5.23E+00	µg/L	NA	NA	NA	NA	NA	2.3E-06	mg/kg/day	7.5E-05	mg/kg/day	3.1E-02
			Exp. Route Total								NA					8.8E-02
		Exposure Point Total									NA					1.3E+00
	Exposure Medium Total										NA					1.3E+00
Groundwater Total											NA					1.3E+00
Receptor Total											NA					1E+00

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.2.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
RDX	1.4E+01	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.54	1.3E-08	2
Antimony	4.1E+00	1.0E-03	NA	NA	NA	NA	0.54	2.2E-09	1
Cadmium	9.3E-01	1.0E-03	NA	NA	NA	NA	0.54	5.0E-10	1
Chromium (hexavalent)	5.2E+00	2.0E-03	NA	NA	NA	NA	0.54	5.6E-09	1

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Ingestion	RDX	1.4E+01	µg/L	1.8E-04	mg/kg/day	8.0E-02	1/(mg/kg/day)	1.4E-05	NA	NA	NA	NA	NA
				Antimony	4.1E+00	µg/L	5.3E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Cadmium	9.3E-01	µg/L	1.2E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chromium (hexavalent)	5.2E+00	µg/L	6.7E-05	mg/kg/day	5.0E-01	1/(mg/kg/day)	1.0E-04	NA	NA	NA	NA	NA
			Exp. Route Total								1.2E-04					NA
	Tapwater	Tapwater	Dermal	RDX	1.4E+01	µg/L	1.5E-06	mg/kg/day	8.0E-02	1/(mg/kg/day)	1.2E-07	NA	NA	NA	NA	NA
				Antimony	4.1E+00	µg/L	2.7E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Cadmium	9.3E-01	µg/L	6.2E-08	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chromium (hexavalent)	5.2E+00	µg/L	7.0E-07	mg/kg/day	2.0E+01	1/(mg/kg/day)	4.1E-05	NA	NA	NA	NA	NA
			Exp. Route Total								4.1E-05					NA
		Exposure Point Total									1.6E-04					NA
	Exposure Medium Total										1.6E-04					NA
Groundwater Total											1.6E-04					NA
Receptor Total											2E-04					NA

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.3.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations										
							Intake					CSF/Unit Risk					Cancer Risk
					Value	Units	Value				Units	Value				Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)		
Groundwater	Groundwater	Tapwater	Ingestion	Chromium (hexavalent)	5.2E+00	ug/L	7.5E-06	1.5E-05	2.2E-05	2.2E-05	mg/kg-day	5.0E+00	1.5E+00	1.5E+00	5.0E-01	1/(mg/kg-day)	1E-04
			Dermal	Chromium (hexavalent)	5.2E+00	ug/L	6.6E-08	1.3E-07	2.5E-07	2.5E-07	mg/kg-day	2.0E+02	6.0E+01	6.0E+01	2.0E+01	1/(mg/kg-day)	4E-05

Notes:
ADAF = Age-dependent adjustment factor
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	Cadmium	9.3E-01	µg/L	NA	NA	NA	NA	NA	2.8E-05	mg/kg/day	1.0E-04	mg/kg/day	2.8E-01
				Chromium (hexavalent)	5.2E+00	µg/L	NA	NA	NA	NA	NA	1.6E-04	mg/kg/day	3.0E-03	mg/kg/day	5.2E-02
			Exp. Route Total								NA					3.3E-01
	Tapwater	Tapwater	Dermal	Cadmium	9.3E-01	µg/L	NA	NA	NA	NA	NA	1.6E-07	mg/kg/day	5.0E-06	mg/kg/day	3.1E-02
				Chromium (hexavalent)	5.2E+00	µg/L	NA	NA	NA	NA	NA	1.7E-06	mg/kg/day	7.5E-05	mg/kg/day	2.3E-02
			Exp. Route Total								NA					5.4E-02
		Exposure Point Total									NA					3.9E-01
	Exposure Medium Total										NA					3.9E-01
Groundwater Total											NA					3.9E-01
Receptor Total											NA					4E-01

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.4.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Cadmium	9.3E-01	1.0E-03	NA	NA	NA	NA	0.71	6.6E-10	1
Chromium (hexavalent)	5.2E+00	2.0E-03	NA	NA	NA	NA	0.71	7.4E-09	1

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater	Tapwater	Tapwater	Ingestion	Cadmium	9.3E-01	µg/L	NA	NA	NA	NA	NA	4.6E-05	mg/kg/day	1.0E-04	mg/kg/day	4.6E-01
				Chromium (hexavalent)	5.2E+00	µg/L	NA	NA	NA	NA	NA	2.6E-04	mg/kg/day	3.0E-03	mg/kg/day	8.7E-02
			Exp. Route Total								NA					5.5E-01
	Tapwater	Tapwater	Dermal	Cadmium	9.30E-01	µg/L	NA	NA	NA	NA	NA	2.0E-07	mg/kg/day	5.0E-06	mg/kg/day	4.1E-02
				Chromium (hexavalent)	5.23E+00	µg/L	NA	NA	NA	NA	NA	2.3E-06	mg/kg/day	7.5E-05	mg/kg/day	3.1E-02
			Exp. Route Total								NA					7.2E-02
		Exposure Point Total									NA					6.2E-01
	Exposure Medium Total										NA					6.2E-01
Groundwater Total											NA					6.2E-01
Receptor Total											NA					6E-01

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.5.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Cadmium	9.3E-01	1.0E-03	NA	NA	NA	NA	0.54	5.0E-10	1
Chromium (hexavalent)	5.2E+00	2.0E-03	NA	NA	NA	NA	0.54	5.6E-09	1

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	Cadmium	9.3E-01	µg/L	1.2E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chromium (hexavalent)	5.2E+00	µg/L	6.7E-05	mg/kg/day	5.0E-01	1/(mg/kg/day)	1.0E-04	NA	NA	NA	NA	NA
			Exp. Route Total								1.0E-04					NA
	Tapwater	Tapwater	Dermal	Cadmium	9.3E-01	µg/L	6.2E-08	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chromium (hexavalent)	5.2E+00	µg/L	7.0E-07	mg/kg/day	2.0E+01	1/(mg/kg/day)	4.1E-05	NA	NA	NA	NA	NA
			Exp. Route Total								4.1E-05					NA
		Exposure Point Total									1.5E-04					NA
	Exposure Medium Total										1.5E-04					NA
Groundwater Total											1.5E-04					NA
Receptor Total											1E-04					NA

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.6.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations										
					Value	Units	Intake					CSF/Unit Risk					Cancer Risk
							Value				Units	Value				Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)		
Groundwater	Groundwater	Tapwater	Ingestion	Chromium (hexavalent)	5.2E+00	ug/L	7.5E-06	1.5E-05	2.2E-05	2.2E-05	mg/kg-day	5.0E+00	1.5E+00	1.5E+00	5.0E-01	1/(mg/kg-day)	1E-04
			Dermal	Chromium (hexavalent)	5.2E+00	ug/L	6.6E-08	1.3E-07	2.5E-07	2.5E-07	mg/kg-day	2.0E+02	6.0E+01	6.0E+01	2.0E+01	1/(mg/kg-day)	4E-05

Notes:

ADAF = Age-dependent adjustment factor

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	RDX	1.4E+01	µg/L	NA	NA	NA	NA	NA	4.2E-04	mg/kg/day	4.0E-03	mg/kg/day	1.0E-01
			Exp. Route Total								NA					1.0E-01
	Tapwater	Tapwater	Dermal	RDX	1.4E+01	µg/L	NA	NA	NA	NA	NA	3.5E-06	mg/kg/day	4.0E-03	mg/kg/day	8.8E-04
			Exp. Route Total								NA					8.8E-04
		Exposure Point Total									NA					1.1E-01
	Exposure Medium Total										NA					1.1E-01
Groundwater Total											NA					1.1E-01
Receptor Total											NA					1E-01

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.7.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
RDX	1.4E+01	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.71	1.5E-08	1

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
$2 \times FA \times Kp \times Cw \times (\mathrm{sqrt}((6 \times \tau \times t_{event}) / (3.1415))) \times CF1 \times CF2$ (Eq 1)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	RDX	1.4E+01	µg/L	NA	NA	NA	NA	NA	7.0E-04	mg/kg/day	4.0E-03	mg/kg/day	1.7E-01
			Exp. Route Total								NA					1.7E-01
	Tapwater	Tapwater	Dermal	RDX	1.40E+01	µg/L	NA	NA	NA	NA	NA	5.3E-06	mg/kg/day	4.0E-03	mg/kg/day	1.3E-03
			Exp. Route Total								NA					1.3E-03
		Exposure Point Total									NA					1.8E-01
	Exposure Medium Total										NA					1.8E-01
Groundwater Total											NA					1.8E-01
Receptor Total											NA					2E-01

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.8.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
North Burn Pads Landfill
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
RDX	1.4E+01	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.54	1.3E-08	1

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 1)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future	
Receptor Population: Resident	
Receptor Age: Adult/Child Aggregate	

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	RDX	1.4E+01	µg/L	1.8E-04	mg/kg/day	8.0E-02	1/(mg/kg/day)	1.4E-05	NA	NA	NA	NA	NA
			Exp. Route Total								1.4E-05					NA
	Tapwater	Tapwater	Dermal	RDX	1.4E+01	µg/L	1.5E-06	mg/kg/day	8.0E-02	1/(mg/kg/day)	1.2E-07	NA	NA	NA	NA	NA
			Exp. Route Total								1.2E-07					NA
		Exposure Point Total									1.4E-05					NA
	Exposure Medium Total										1.4E-05					NA
Groundwater Total											1.4E-05					NA
Receptor Total											1E-05					NA

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	RDX	NA	NA	NA	NA	Neurological	1E-01	NA	9E-04	1E-01
			Antimony	NA	NA	NA	NA	Whole Body	3E-01	NA	1E-02	3E-01
			Cadmium	NA	NA	NA	NA	Urinary	3E-01	NA	3E-02	3E-01
			Chromium (hexavalent)	NA	NA	NA	NA	NOE	5E-02	NA	2E-02	8E-02
		Exposure Point Total		NA	NA	NA	NA		7E-01	NA	7E-02	8E-01
	Exposure Medium Total			NA	NA	NA	NA		7E-01	NA	7E-02	8E-01
Groundwater Total				NA	NA	NA	NA		7E-01	NA	7E-02	8E-01
Receptor Total				NA	NA	NA	NA		7E-01	NA	7E-02	8E-01

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Neurological HI Across Media =	0.1
Total NOE HI Across Media =	0.08
Total Urinary HI Across Media =	0.3
Total Whole Body HI Across Media =	0.3

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	RDX	NA	NA	NA	NA	Neurological	2E-01	NA	1E-03	2E-01
			Antimony	NA	NA	NA	NA	Whole Body	5E-01	NA	2E-02	5E-01
			Cadmium	NA	NA	NA	NA	Urinary	5E-01	NA	4E-02	5E-01
			Chromium (hexavalent)	NA	NA	NA	NA	NOE	9E-02	NA	3E-02	1E-01
		Exposure Point Total		NA	NA	NA	NA		1E+00	NA	9E-02	1E+00
	Exposure Medium Total			NA	NA	NA	NA		1E+00	NA	9E-02	1E+00
Groundwater Total				NA	NA	NA	NA		1E+00	NA	9E-02	1E+00
Receptor Total				NA	NA	NA	NA		1E+00	NA	9E-02	1E+00

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Neurological HI Across Media =	0.2
Total NOE HI Across Media =	0.1
Total Urinary HI Across Media =	0.5
Total Whole Body HI Across Media =	0.5

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	RDX	1E-05	NA	1E-07	1E-05	NA	NA	NA	NA	NA
			Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chromium (hexavalent)	1E-04	NA	4E-05	1E-04	NA	NA	NA	NA	NA
		Exposure Point Total		1E-04	NA	4E-05	2E-04		NA	NA	NA	NA
	Exposure Medium Total			1E-04	NA	4E-05	2E-04		NA	NA	NA	NA
Groundwater Total				1E-04	NA	4E-05	2E-04		NA	NA	NA	NA
Receptor Total				1E-04	NA	4E-05	2E-04		NA	NA	NA	NA

Notes: NA = Not applicable or not available

TABLE 9.4.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future	
Receptor Population: Resident	
Receptor Age: Adult	

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	Cadmium	NA	NA	NA	NA	Urinary	3E-01	NA	3E-02	3E-01
			Chromium (hexavalent)	NA	NA	NA	NA	NOE	5E-02	NA	2E-02	8E-02
		Exposure Point Total		NA	NA	NA	NA		3E-01	NA	5E-02	4E-01
	Exposure Medium Total			NA	NA	NA	NA		3E-01	NA	5E-02	4E-01
Groundwater Total				NA	NA	NA	NA		3E-01	NA	5E-02	4E-01
Receptor Total				NA	NA	NA	NA		3E-01	NA	5E-02	4E-01

Notes: HI = Hazard Index; NA = Not applicable or not available

Total NOE HI Across Media =	0.08
Total Urinary HI Across Media =	0.3

TABLE 9.5.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	Cadmium	NA	NA	NA	NA	Urinary	5E-01	NA	4E-02	5E-01
			Chromium (hexavalent)	NA	NA	NA	NA	NOE	9E-02	NA	3E-02	1E-01
		Exposure Point Total		NA	NA	NA	NA		6E-01	NA	7E-02	6E-01
	Exposure Medium Total			NA	NA	NA	NA		6E-01	NA	7E-02	6E-01
Groundwater Total				NA	NA	NA	NA		6E-01	NA	7E-02	6E-01
Receptor Total				NA	NA	NA	NA		6E-01	NA	7E-02	6E-01

Notes: HI = Hazard Index; NA = Not applicable or not available

Total NOE HI Across Media =	0.1
Total Urinary HI Across Media =	0.5

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chromium (hexavalent)	1E-04	NA	4E-05	1E-04	NA	NA	NA	NA	NA
		Exposure Point Total		1E-04	NA	4E-05	1E-04		NA	NA	NA	NA
	Exposure Medium Total			1E-04	NA	4E-05	1E-04		NA	NA	NA	NA
Groundwater Total				1E-04	NA	4E-05	1E-04		NA	NA	NA	NA
Receptor Total				1E-04	NA	4E-05	1E-04		NA	NA	NA	NA

Notes: NA = Not applicable or not available

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Tapwater	Tapwater	RDX	NA	NA	NA	NA	Neurological	1E-01	NA	9E-04	1E-01
		Exposure Point Total		NA	NA	NA	NA		1E-01	NA	9E-04	1E-01
	Exposure Medium Total			NA	NA	NA	NA		1E-01	NA	9E-04	1E-01
Groundwater Total				NA	NA	NA	NA		1E-01	NA	9E-04	1E-01
Receptor Total				NA	NA	NA	NA		1E-01	NA	9E-04	1E-01

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Neurological HI Across Media = 0.1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, North Burn Pads Landfill, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBPLF	JAW-625	JAW-625-19970708	WG	7/8/1997	7.5	17.5	Arsenic	0.76	U	µg/L	0.76	
AOC_GW_NBPLF	JAW-625	JAW-625-19970708	WG	7/8/1997	7.5	17.5	Barium	76.5	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970708	WG	7/8/1997	7.5	17.5	Cadmium	0.93	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970708	WG	7/8/1997	7.5	17.5	Chromium	1.07	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970708	WG	7/8/1997	7.5	17.5	Lead	5.84	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970708	WG	7/8/1997	7.5	17.5	Mercury	0.03	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970708	WG	7/8/1997	7.5	17.5	Selenium	1.2	U	µg/L	1.2	
AOC_GW_NBPLF	JAW-625	JAW-625-19970708	WG	7/8/1997	7.5	17.5	Silver	0.32	U	µg/L	0.32	
AOC_GW_NBPLF	JAW-625	JAW-625-19970722	WG	7/22/1997	7.5	17.5	Arsenic	0.76	U	µg/L	0.76	
AOC_GW_NBPLF	JAW-625	JAW-625-19970722	WG	7/22/1997	7.5	17.5	Barium	68.2	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970722	WG	7/22/1997	7.5	17.5	Cadmium	0.48	U	µg/L	0.48	
AOC_GW_NBPLF	JAW-625	JAW-625-19970722	WG	7/22/1997	7.5	17.5	Chromium	5.23	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970722	WG	7/22/1997	7.5	17.5	Lead	0.3	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970722	WG	7/22/1997	7.5	17.5	Mercury	0.06	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970722	WG	7/22/1997	7.5	17.5	Selenium	1.33	=	µg/L		
AOC_GW_NBPLF	JAW-625	JAW-625-19970722	WG	7/22/1997	7.5	17.5	Silver	0.32	U	µg/L	0.32	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Aluminum	33.5	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Antimony	4.1	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Arsenic	20	U	µg/L	20	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Barium	251	=	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Beryllium	5	U	µg/L	5	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Cadmium	0.56	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Calcium	83500	=	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Chromium	1	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Cobalt	50	U	µg/L	50	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Copper	2.2	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Iron	100	U	µg/L	100	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Lead	10	U	µg/L	10	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Magnesium	36400	=	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Manganese	6.7	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Mercury	0.2	U	µg/L	0.2	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Nickel	2.7	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Potassium	2920	BE	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Selenium	10	U	µg/L	10	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Silver	0.45	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Sodium	32200	E	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Thallium	20	U	µg/L	20	
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Vanadium	0.34	B	µg/L		
AOC_GW_NBPLF	JAW-626	F04GW003	WG	11/10/2004	7.5	17.5	Zinc	40	U	µg/L	40	
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	1,3,5-Trinitrobenzene	0.11	U	µg/L	0.11	0.16
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	1,3-Dinitrobenzene	0.11	U	µg/L	0.11	0.16
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	2,4,6-Trinitrotoluene	0.11	U	µg/L	0.11	0.16

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, North Burn Pads Landfill, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	2,4-Dinitrotoluene	0.11	U	µg/L	0.11	0.14
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	2,6-Dinitrotoluene	0.11	U	µg/L	0.11	0.14
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	2-Amino-4,6-dinitrotoluene	0.11	U	µg/L	0.11	0.16
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	2-Nitrotoluene	0.21	U	µg/L	0.21	0.53
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	3-Nitrotoluene	0.21	U	µg/L	0.21	0.53
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	4-Amino-2,6-dinitrotoluene	0.11	U	µg/L	0.11	0.16
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	4-Nitrotoluene	0.21	U	µg/L	0.21	0.53
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	DNX	0.11	U	µg/L	0.11	0.53
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	HMX	1	=	µg/L	0.11	0.16
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	MNX	0.11	U	µg/L	0.11	0.53
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	Nitrobenzene	0.11	U	µg/L	0.11	0.16
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	RDX	0.27	=	µg/L	0.11	0.16
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	Tetryl	0.11	U	µg/L	0.11	0.16
AOC_GW_NBPLF	JAW-626	JAW-626-0618	WG	6/24/2018	7.5	17.5	TNX	0.21	U	µg/L	0.21	0.53
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	1,3,5-Trinitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	1,3-Dinitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2,4,6-Trinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2,4-Dinitrotoluene	0.1	U	µg/L	0.1	0.13
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2,6-Dinitrotoluene	0.1	U	µg/L	0.1	0.13
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2-Amino-4,6-dinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	3-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	4-Amino-2,6-dinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	4-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	DNX	0.1	U	µg/L	0.1	0.5
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	HMX	7.9	=	µg/L	0.1	0.15
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	MNX	0.1	U	µg/L	0.1	0.5
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	Nitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	RDX	14	=	µg/L	20	20
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	Tetryl	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	TNX	0.2	U	µg/L	0.2	0.5
AOC_GW_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Arsenic	10	U	µg/L	10	
AOC_GW_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Barium	246	=	µg/L		
AOC_GW_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Cadmium	5	U	µg/L	5	
AOC_GW_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Chromium	2.3	J	µg/L		
AOC_GW_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Lead	10	U	µg/L	10	
AOC_GW_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Mercury	0.2	U	µg/L	0.2	
AOC_GW_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Selenium	10	U	µg/L	10	
AOC_GW_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Silver	0.54	J	µg/L		
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	1,3,5-Trinitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	1,3-Dinitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	2,4,6-Trinitrotoluene	0.1	U	µg/L	0.1	0.15

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, North Burn Pads Landfill, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	2,4-Dinitrotoluene	0.1	U	µg/L	0.1	0.13
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	2,6-Dinitrotoluene	0.1	U	µg/L	0.1	0.13
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	2-Amino-4,6-dinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	2-Nitrotoluene	0.21	U	µg/L	0.21	0.52
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	3-Nitrotoluene	0.21	U	µg/L	0.21	0.52
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	4-Amino-2,6-dinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	4-Nitrotoluene	0.21	U	µg/L	0.21	0.52
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	DNX	0.1	U	µg/L	0.1	0.52
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	HMX	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	MNX	0.1	U	µg/L	0.1	0.52
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	Nitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	RDX	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	Tetryl	0.1	U	µg/L	0.1	0.15
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-0618	WG	6/24/2018	58	68	TNX	0.21	U	µg/L	0.21	0.52
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-20031119	WG	11/19/2003	58	68	Arsenic	10	U	µg/L	10	
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-20031119	WG	11/19/2003	58	68	Barium	184	J	µg/L		
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-20031119	WG	11/19/2003	58	68	Cadmium	0.9	J	µg/L		
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-20031119	WG	11/19/2003	58	68	Chromium	1.1	J	µg/L		
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-20031119	WG	11/19/2003	58	68	Lead	10	U	µg/L	10	
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-20031119	WG	11/19/2003	58	68	Mercury	0.2	U	µg/L	0.2	
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-20031119	WG	11/19/2003	58	68	Selenium	10	U	µg/L	10	
AOC_GW_NBPLF	NBPLF-MW1	NBPLF-MW1-20031119	WG	11/19/2003	58	68	Silver	10	U	µg/L	10	
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	DNX	0.25	U	µg/L	0.25	0.49
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	HMX	0.2	U	µg/L	0.2	0.39
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	MNX	0.28	U	µg/L	0.28	0.49
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	RDX	0.39	U	µg/L	0.39	0.39
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	TNX	0.25	U	µg/L	0.25	0.49
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	1,3,5-Trinitrobenzene	0.43	U	µg/L	0.43	1.1
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.43
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	2,4,6-Trinitrotoluene	0.43	U	µg/L	0.43	0.43

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, North Burn Pads Landfill, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.43
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	2-Nitrotoluene	0.21	U	µg/L	0.21	0.43
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	3-Nitrotoluene	0.43	U	µg/L	0.43	0.43
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	4-Nitrotoluene	0.43	U	µg/L	0.43	1.1
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	DNX	0.27	U	µg/L	0.27	0.53
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	HMX	5.6	=	µg/L	0.21	0.43
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	MNX	0.14	J	µg/L	0.099	0.53
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	Nitrobenzene	0.21	U	µg/L	0.21	0.43
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	RDX	4.7	=	µg/L	0.43	0.43
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	Tetryl	0.21	U	µg/L	0.21	0.26
AOC_GW_NBPLF	NBPLF-MW4	NBPLF-MW4-0420	WG	4/20/2020	24.5	34.5	TNX	0.27	U	µg/L	0.27	0.53
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	1,3,5-Trinitrobenzene	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	1,3-Dinitrobenzene	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	2,4,6-Trinitrotoluene	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	2,4-Dinitrotoluene	0.1	U	µg/L	0.1	0.14
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	2,6-Dinitrotoluene	0.1	U	µg/L	0.1	0.14
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	2-Amino-4,6-dinitrotoluene	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	2-Nitrotoluene	0.21	U	µg/L	0.21	0.52
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	3-Nitrotoluene	0.21	U	µg/L	0.21	0.52
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	4-Amino-2,6-dinitrotoluene	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	4-Nitrotoluene	0.21	U	µg/L	0.21	0.52
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	DNX	0.1	U	µg/L	0.1	0.52
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	HMX	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	MNX	0.1	U	µg/L	0.1	0.52
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	Nitrobenzene	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	RDX	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	Tetryl	0.1	U	µg/L	0.1	0.16
AOC_GW_NBPLF	NBPLF-MW5	NBPLF-MW5-0618	WG	6/24/2018	39	49	TNX	0.21	U	µg/L	0.21	0.52
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	DNX	0.25	U	µg/L	0.25	0.5

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, North Burn Pads Landfill, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	HMX	2.8	=	µg/L	0.2	0.4
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	MNX	1.6	J	µg/L	0.29	0.5
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	RDX	4.1	=	µg/L	0.4	0.4
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_NBPLF	NBPLF-MW6	NBPLF-MW6-0420	WG	4/21/2020	26.5	36.5	TNX	0.25	U	µg/L	0.25	0.5
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	1,3,5-Trinitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	1,3-Dinitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2,4,6-Trinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2,4-Dinitrotoluene	0.1	U	µg/L	0.1	0.13
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2,6-Dinitrotoluene	0.1	U	µg/L	0.1	0.13
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2-Amino-4,6-dinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	3-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	4-Amino-2,6-dinitrotoluene	0.1	U	µg/L	0.1	0.15
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	4-Nitrotoluene	0.2	U	µg/L	0.2	0.5
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	DNX	0.1	U	µg/L	0.1	0.5
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	HMX	7.9	=	µg/L	0.1	0.15
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	MNX	0.1	U	µg/L	0.1	0.5
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	Nitrobenzene	0.1	U	µg/L	0.1	0.15
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	RDX	14	=	µg/L	20	20
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	Tetryl	0.1	U	µg/L	0.1	0.15
AOC_Plume_NBPLF	JAW-627	JAW-627-0618	WG	6/25/2018	27.5	37.5	TNX	0.2	U	µg/L	0.2	0.5
AOC_Plume_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Arsenic	10	U	µg/L	10	
AOC_Plume_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Barium	246	=	µg/L		
AOC_Plume_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Cadmium	5	U	µg/L	5	
AOC_Plume_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Chromium	2.3	J	µg/L		
AOC_Plume_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Lead	10	U	µg/L	10	
AOC_Plume_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Mercury	0.2	U	µg/L	0.2	
AOC_Plume_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Selenium	10	U	µg/L	10	
AOC_Plume_NBPLF	JAW-627	JAW-627-20031119	WG	11/19/2003	27.5	37.5	Silver	0.54	J	µg/L		
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.98
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.39
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	2-Nitrotoluene	0.2	UJ	µg/L	0.2	0.39
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	4-Nitrotoluene	0.39	U	µg/L	0.39	0.98
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	DNX	0.25	U	µg/L	0.25	0.49

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, North Burn Pads Landfill, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	HMX	0.2	U	µg/L	0.2	0.39
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	MNX	0.28	U	µg/L	0.28	0.49
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	Nitrobenzene	0.2	U	µg/L	0.2	0.39
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	RDX	0.39	U	µg/L	0.39	0.39
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_Plume_NBPLF	NBPLF-MW3	NBPLF-MW3-0319	WG	3/25/2019	57	67	TNX	0.25	U	µg/L	0.25	0.49

Notes:

(1) The data were reduced such that when a normal and duplicate sample were available, the highest detected concentration among normal or duplicate samples was used when a chemical was detected in any sample. If both results were non-detect, the lowest reported detection limit (i.e., reporting limit) was used.

NA = Not available

WG - groundwater

J - compound was detected below the reporting limit in the sample

= - detected

U - not detected

µg/L - microgram per liter

ATTACHMENT 3

Non-detected Data Analysis: North Burn Pads Landfill

Chemicals that were 100 percent non-detected (ND) in a data grouping were not identified as COPCs for that data grouping; however, a qualitative evaluation of the 100 percent (%) ND chemicals within North Burn Pads Landfill (NBPLF) groundwater was conducted.

Detection limits (DLs) and reporting limits (RLs) for chemicals that were 100 % ND were compared to groundwater screening levels (SLs). Groundwater SLs are the USEPA Regional Screening levels (RSLs) for tap water (USEPA, 2023) using an excess lifetime cancer risk (ELCR) of $1x10^{-6}$ and a hazard quotient (HQ) of 1. The NBPLF ND chemicals and a comparison of the ND DLs and RLs to SLs is provided in Attachment 3 (Table 1). ND chemicals exceeding SLs are identified and discussed below with regard to the frequency of exceedance and potential to be related to former site activities.

Non-detected Chemicals Exceeding Screening Levels

Four ND explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene) had RLs greater than SLs. However, only 2,6-dinitrotoluene and nitrobenzene had DLs greater than SLs. Three ND metals (arsenic, cobalt and thallium) had DLs greater than SLs. RLs were not available for the ND metals. Explosives with DLs and/or RLs greater than SLs had a dataset of 7 samples per explosive. The ND dataset for arsenic consisted of 5 samples and cobalt and thallium had 1 sample each.

Two explosives (DNX and TNX) were consistently ND in the NBPLF data set, but SLs were not available for these ND chemicals. Therefore, those ND chemicals were not included in the ND assessment process.

Non-detected Chemicals Related to Former Site Activities

To determine whether ND data exceeding SLs could potentially be related to former site activities, the historical IAAAP facility-wide dataset for the non-Formerly Utilized Sites Remedial Action Program (FUSRAP) sites was evaluated, and results are provided in Attachment 3 (Table 2). The ND comparison included historically detected chemicals in all media; however, surface water and sediment are not present at NBPLF and soil is being addressed under the Operable Unit 1 Remedial Action.

- **ND Explosives**: 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene have been historically detected in groundwater, soil and surface water at IAAAP and, with the exception of 2-nitrotoluene, all have been historically detected in sediment at IAAAP. It is noted that DLs (ranging from 0.1 to 0.21 ug/L) and RLs (ranging from 0.13 to 0.53 ug/L) for the 4 ND explosives with DLs and/or RLs greater than SLs are acceptably low for an explosives analysis. Additionally, when compared to the other ND explosive with DLs and RLs less than SLs, the SLs for the 4 ND explosives with DLs and RLs greater than SLs also have the lowest SLs for all the ND explosives. As a result, having acceptably low DLs and RLs for explosives analysis, it is highly probable that the ND explosives with DLs and RLs greater than SLs are due to the relatively higher toxicity of these 4 explosives in comparison to the other analyzed ND explosives, and it is unlikely that any of the ND explosives are present in site groundwater.

- **ND Metals:** Arsenic, cobalt and thallium have been historically detected in soil, surface water and sediment at IAAAP. However, only arsenic and cobalt have been historically detected in groundwater at IAAAP. Although all 5 arsenic samples had DLs greater than SLs, it is noted with the exception of one DL at 20 ug/L, all other DLs were equal to or less than the arsenic Maximum Contaminant Level (MCL) of 10 ug/L (USEPA, 2023). Based on the majority of the arsenic data set (80%) being equal to or less than the MCL and all arsenic results in the groundwater dataset being 100% ND, it is unlikely that arsenic is present in groundwater at unacceptable concentrations.

DLs available for the ND metals are typical of a USEPA 6010 metals analysis (USEPA, 2014), including the cobalt DL. However, it is noted that, aside from arsenic and thallium, cobalt has a significantly lower SL in comparison to the other ND metals. As a result, the cobalt DL greater than the SL is most likely due to the higher toxicity of cobalt in comparison to the other ND metals that did not have DLs greater than SLs; and it is unlikely that any of the ND metals are present in site groundwater.

The thallium oral RfD of 1×10^{-5} mg/kg-day in the RSL table is a provisional toxicity value presented in an appendix to the main Provisional Peer Reviewed Toxicity Value (PPRTV) document (USEPA, 2012). Due to the lack of availability of suitable human studies noted in the main document, USEPA decided that it was inappropriate to derive a chronic PPRTV for thallium and instead presented the oral RfD value as a screening toxicity value in an appendix. USEPA warns that users of screening toxicity values in an appendix to a PPRTV assessment should understand that there is considerably more uncertainty associated with the derivation of a supplemental screening toxicity value than for a value presented in the body of the PPRTV assessment. Due to the high level of uncertainty associated with this value, potential risks associated with thallium are typically evaluated qualitatively as opposed to calculating numerical risk estimates.

Conclusions

Four explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene), and 3 metals (arsenic, cobalt and thallium) have DLs and/or RLs exceeding SLs at the NBPLF. Although the DLs and/or RLs for these ND chemicals are greater than the SLs, based on the acceptably low DLs, further consideration of ND chemicals does not appear warranted in the NBPLF HHRA.

References

U.S. Environmental Protection Agency (USEPA). 2012. *Provisional Peer Reviewed Toxicity Values for Thallium and Compounds Metallic Thallium (7440-28-0), Thallium (I) acetate (563-68-8), Thallium (I) carbonate (6533-73-9), Thallium (I) chloride (7791-12-0), Thallium (I) nitrate (10102-45-1), and Thallium (I) sulfate (7446-18-6). Superfund Health Risk Technical Support Center*. National Center for Environmental Assessment Final. October.

USEPA. 2014. *Method 6010D (SW-846): Inductively Coupled Plasma-Atomic Emission Spectrometry*. Revision 4.

USEPA. 2023. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* May.

ATTACHMENT 3, TABLE 1
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, North Burn Pads Landfill, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
Explosives	99-35-4	1,3,5-Trinitrobenzene	ug/L	0 / 7	0.1	0.43	0.15	1.1	590	0	0
Explosives	99-65-0	1,3-Dinitrobenzene	ug/L	0 / 7	0.1	0.21	0.15	0.43	2	0	0
Explosives	118-96-7	2,4,6-Trinitrotoluene	ug/L	0 / 7	0.1	0.43	0.15	0.43	2.5	0	0
Explosives	121-14-2	2,4-Dinitrotoluene	ug/L	0 / 7	0.1	0.21	0.13	0.43	0.24	0	3
Explosives	606-20-2	2,6-Dinitrotoluene	ug/L	0 / 7	0.1	0.21	0.13	0.21	0.049	7	7
Explosives	35572-78-2	2-Amino-4,6-dinitrotoluene	ug/L	0 / 7	0.1	0.13	0.15	0.21	1.9	0	0
Explosives	88-72-2	2-Nitrotoluene	ug/L	0 / 7	0.2	0.21	0.39	0.53	0.31	0	7
Explosives	99-08-1	3-Nitrotoluene	ug/L	0 / 7	0.2	0.43	0.39	0.53	1.7	0	0
Explosives	19406-51-0	4-Amino-2,6-dinitrotoluene	ug/L	0 / 7	0.1	0.13	0.15	0.21	1.9	0	0
Explosives	99-99-0	4-Nitrotoluene	ug/L	0 / 7	0.2	0.43	0.5	1.1	4.3	0	0
Explosives	DNX	DNX	ug/L	0 / 7	0.1	0.27	0.49	0.53	--	--	--
Explosives	98-95-3	Nitrobenzene	ug/L	0 / 7	0.1	0.21	0.15	0.43	0.14	3	7
Explosives	479-45-8	Tetryl	ug/L	0 / 7	0.1	0.21	0.15	0.26	39	0	0
Explosives	13980-04-6	TNX	ug/L	0 / 7	0.2	0.27	0.49	0.53	--	--	--
Metals	7440-38-2	Arsenic	ug/L	0 / 5	0.76	20	--	--	0.052	5	--
Metals	7440-41-7	Beryllium	ug/L	0 / 1	5	5	--	--	25	0	--
Metals	7440-48-4	Cobalt	ug/L	0 / 1	50	50	--	--	6	1	--
Metals	7439-89-6	Iron	ug/L	0 / 1	100	100	--	--	14000	0	--
Metals	7440-28-0	Thallium	ug/L	0 / 1	20	20	--	--	0.2	1	--
Metals	7440-66-6	Zinc	ug/L	0 / 1	40	40	--	--	6000	0	--

Notes:
(1) Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2023) - Tapwater. Concentrations based on non-carcinogenic health effects are based on HQ=1; carcinogenic effects are based on risk of 1E-06. Available: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
[2] The maximum detection limit and reporting limit were compared to the screening level.

FOD = frequency of detect
ug/L = microgram per liter

ATTACHMENT 3, TABLE 2

Historically Detected Chemicals at IAAAP

Iowa Army Ammunition Plant, North Burn Pads Landfill, Middletown, Iowa

100% ND Chemical > SL	Detected in Groundwater	Detected in soil	Detected in Surface Water	Detected in Sediment
2,4-Dinitrotoluene	X	X	X	X
2,6-Dinitrotoluene	X	X	X	X
2-Nitrotoluene	X	X	X	--
Nitrobenzene	X	X	X	X
Arsenic	X	X	X	X
Cobalt	X	X	X	X
Thallium	--	X	X	X

X = chemical was historically detected

-- = chemical was not historically detected.

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Soil	Soil	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion, Inhalation	On-site	None	The Fire Training Pit is open to recreational use; therefore, hunting is permitted at the site. However, soil is addressed under OU1 with land use controls for industrial land use.
	Surface Water/Sediment	Surface Water/Sediment	Drainage Ditches	Hunter/Recreator	Adult, Adolescent	Dermal, Ingestion	On-site	None	The Fire Training Pit is open to recreational use; therefore, hunting is permitted at the site. However, there are no perennial waterbodies present at the site, thus surface water and sediment were not evaluated in the HHRA.
Future	Soil	Soil	Soil	Site Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	Soil is addressed under OU1 with land use controls for industrial land use.
				Construction/ Utility Worker	Adult	Dermal, Ingestion, Inhalation	On-site	None	
				Hypothetical Resident	Adult, Child	Dermal, Ingestion, Inhalation	On-site	None	
	Groundwater(1)	Tapwater	Tapwater	Site Worker	Adult	Dermal, Ingestion	On-site	Quant (2)	Future site workers could use groundwater as a potable water source. Site workers could ingest drinking water and could have dermal contact with groundwater while hand washing.
				Hypothetical Resident	Adult, Child	Dermal, Ingestion	On-site	Quant	Future hypothetical residents could use groundwater as a potable water source. Residents could ingest drinking water and could have dermal contact with groundwater while showering.
		Household Air (Domestic Use)	Vapors in House (Domestic Use)	Hypothetical Resident	Adult, Child	Inhalation	On-site	Quant	Future hypothetical residents could be exposed to vapors in household air via inhalation.
		Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Hypothetical Resident	Adult, Child	Inhalation	On-Site	Quant	Future hypothetical residents could inhale volatile groundwater constituents in indoor air from vapor intrusion.
				Site Worker	Adult	Inhalation	On-site	Quant (2)	Site workers could inhale volatile groundwater constituents in indoor air from vapor intrusion.
	Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Construction/ Utility Worker	Adult	Dermal, Ingestion	On-site	Quant (2)	Construction/utility workers could incidentally ingest and have dermal contact with shallow groundwater in a trench while replacing the culverts within the groundwater plume associated with the Fire Training Pit.
		Trench Air	Vapors in a Trench	Construction/ Utility Worker	Adult	Inhalation	On-site	Quant (2)	Construction/utility workers could inhale volatile groundwater constituents in trench air while replacing culverts within the groudnwater plume associated with the Fire Training Pit.

Notes:
Quant: Quantitative evaluation

(1) Groundwater is not currently being used as a potable water source and there are no plans to use groundwater for potable purposes in the future; however, based on applicable CERCLA policy and guidance, groundwater at the Fire Training Area is classified as Class IIB, a potential source of drinking water. Therefore, the HHRA evaluates potential exposures to groundwater due to its potential future use as a drinking water source. This requires the evaluation of future residential exposures to groundwater.

(2) Potential exposures to groundwater are only estimated for a site worker and construction/utility worker if the estimated risks for a hypothetical residential scenario exceed acceptable risk levels and COCs are identified for a residential scenario.

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater/Household Air (Domestic Use)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
Tapwater/ Vapors in House (Domestic Use) Fire Training Pit	35572-78-2	2-Amino-4,6-dinitrotoluene	1.2E+00	J	1.2E+00	J	µg/L	SA-99-1	1 / 10	0.12 - 0.13	1.2E+00	NA	1.9E-01	nc	NA	NA	Yes	ASL
	19406-51-0	4-Amino-2,6-dinitrotoluene	4.4E+00	J	4.4E+00	J	µg/L	SA-99-1	1 / 10	0.12 - 0.13	4.4E+00	NA	1.9E-01	nc	NA	NA	Yes	ASL
	2691-41-0	HMX	2.4E-01	J	4.5E-01	J	µg/L	FTA-TT-MW-05	2 / 10	0.09 - 0.21	4.5E-01	NA	1.0E+02	nc	4.0E+02	LHA	No	BSL
	121-82-4	RDX	3.6E-01	J	5.1E+00	J	µg/L	SA-99-1	4 / 10	0.16 - 0.42	5.1E+00	NA	9.7E-01	ca	2.0E+00	LHA	Yes	ASL
	7440-38-2	Arsenic	1.7E+01		5.6E+01		µg/L	SA-99-1	4 / 13	8 - 20	5.6E+01	3.3E+01	5.2E-02	ca	1.0E+01	MCL	Yes	ASL
	7440-39-3	Barium	4.2E+01		2.0E+03		µg/L	FTA-TT-MW-02	13 / 13	1.8 - 9	2.0E+03	4.3E+02	3.8E+02	nc	2.0E+03	MCL	Yes	ASL
	7782-49-2	Selenium	4.3E+00	J	4.3E+00	J	µg/L	JAW-62	1 / 13	2 - 20	4.3E+00	1.0E+01	1.0E+01	nc	5.0E+01	MCL	No	BSL
	91-20-3	Naphthalene	3.7E+00		1.0E+01		µg/L	SA-99-1	2 / 24	0.8 - 80	1.0E+01	NA	1.2E-01	ca	1.0E+02	LHA	Yes	ASL
	95-50-1	1,2-Dichlorobenzene	4.1E-01	J	4.1E-01	J	µg/L	FTA-TT-MW-04	1 / 24	0.15 - 40	4.1E-01	NA	3.0E+01	nc	6.0E+02	MCL	No	BSL
	71-55-6	1,1,1-Trichloroethane	2.4E-01	J	2.0E+03		µg/L	FTA-TT-MW-03	11 / 24	0.16 - 40	2.0E+03	NA	8.0E+02	nc	2.0E+02	MCL	Yes	ASL
	79-00-5	1,1,2-Trichloroethane	4.0E-01	J	2.5E+00	J	µg/L	JAW-60	4 / 24	0.27 - 80	2.5E+00	NA	4.1E-02	nc	5.0E+00	MCL	Yes	ASL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.6E-01	J	5.1E+00	J	µg/L	SA-99-1	6 / 24	0.18 - 40	5.1E+00	NA	1.0E+03	nc	NA	NA	No	BSL
	75-34-3	1,1-Dichloroethane	5.8E-01	J	4.9E+03		µg/L	FTA-TT-MW-03	14 / 24	0.22 - 80	4.9E+03	NA	2.8E+00	ca	NA	NA	Yes	ASL
	75-35-4	1,1-Dichloroethene	1.4E+00	J	2.7E+02		µg/L	FTA-TT-MW-03	10 / 24	0.8 - 80	2.7E+02	NA	2.8E+01	nc	7.0E+00	MCL	Yes	ASL
	95-63-6	1,2,4-Trimethylbenzene	3.3E-01	J	1.1E+02		µg/L	FTA-TT-MW-03	5 / 24	0.15 - 40	1.1E+02	NA	5.6E+00	nc	NA	NA	Yes	ASL
	107-06-2	1,2-Dichloroethane	8.2E-01	J	8.1E+01	J	µg/L	FTA-TT-MW-03	7 / 24	0.13 - 13	8.1E+01	NA	1.7E-01	ca	5.0E+00	MCL	Yes	ASL
	108-67-8	1,3,5-Trimethylbenzene	4.7E+00		3.4E+01	J	µg/L	FTA-TT-MW-03	4 / 24	0.4 - 16	3.4E+01	NA	6.0E+00	nc	NA	NA	Yes	ASL
	99-87-6	4-Isopropyltoluene	4.9E-01	J	3.4E+00	J	µg/L	SA-99-1	2 / 24	0.2 - 40	3.4E+00	NA	NTX		NA	NA	No	NTX
	67-64-1	Acetone	2.0E+02		6.7E+03		µg/L	FTA-TT-MW-02	2 / 24	6.4 - 640	6.7E+03	NA	1.8E+03	nc	NA	NA	Yes	ASL
	71-43-2	Benzene	8.7E-01	J	8.8E+01	J	µg/L	FTA-TT-MW-03	7 / 24	0.16 - 16	8.8E+01	NA	4.6E-01	ca	5.0E+00	MCL	Yes	ASL
	75-15-0	Carbon disulfide	2.6E+01	J	2.6E+01	J	µg/L	FTA-TT-MW-03	1 / 24	0.8 - 32	2.6E+01	NA	8.1E+01	nc	NA	NA	No	BSL
	75-00-3	Chloroethane	2.5E+00	J	1.1E+03		µg/L	FTA-TT-MW-03	6 / 24	1.6 - 160	1.1E+03	NA	8.3E+02	nc	NA	NA	Yes	ASL
	67-66-3	Chloroform	3.5E-01	J	3.5E-01	J	µg/L	JAW-80	1 / 24	0.16 - 16	3.5E-01	NA	2.2E-01	ca	8.0E+01	MCL	Yes	ASL
	156-59-2	cis-1,2-Dichloroethene	4.5E-01	J	2.0E+03		µg/L	FTA-TT-MW-03	11 / 24	0.15 - 40	2.0E+03	NA	2.5E+00	nc	7.0E+01	MCL	Yes	ASL
	100-41-4	Ethylbenzene	3.1E-01	J	1.3E+02		µg/L	FTA-TT-MW-03	6 / 24	0.16 - 40	1.3E+02	NA	1.5E+00	ca	7.0E+02	MCL	Yes	ASL
	98-82-8	Isopropylbenzene	2.3E+00		3.9E+00	J	µg/L	SA-99-1	2 / 24	0.4 - 40	3.9E+00	NA	4.5E+01	nc	NA	NA	No	BSL
	78-93-3	Methyl ethyl ketone	4.4E+01	J	5.1E+03		µg/L	FTA-TT-MW-02	2 / 24	4 - 400	5.1E+03	NA	5.6E+02	nc	4.0E+03	LHA	Yes	ASL
	108-10-1	Methyl isobutyl ketone	1.1E+02		1.7E+03		µg/L	FTA-TT-MW-02	2 / 24	3.2 - 320	1.7E+03	NA	6.3E+02	nc	NA	NA	Yes	ASL
	75-09-2	Methylene chloride	7.6E+00		1.6E+02	J	µg/L	FTA-TT-MW-02	3 / 24	2 - 200	1.6E+02	NA	1.1E+01	nc	5.0E+00	MCL	Yes	ASL
	104-51-8	N-Butylbenzene	1.7E+00	J	1.7E+00	J	µg/L	SA-99-1	1 / 24	0.8 - 80	1.7E+00	NA	1.0E+02	nc	NA	NA	No	BSL
	103-65-1	N-Propylbenzene	2.2E-01	J	5.7E+00	J	µg/L	SA-99-1	3 / 24	0.16 - 40	5.7E+00	NA	6.6E+01	nc	NA	NA	No	BSL
	135-98-8	sec-Butylbenzene	1.7E-01	J	1.2E+00		µg/L	FTA-TT-MW-04	2 / 24	0.17 - 40	1.2E+00	NA	2.0E+02	nc	NA	NA	No	BSL
	127-18-4	Tetrachloroethene	3.8E-01	J	5.9E+01	J	µg/L	FTA-TT-MW-03	7 / 24	0.2 - 20	5.9E+01	NA	4.1E+00	nc	5.0E+00	MCL	Yes	ASL
	108-88-3	Toluene	1.8E-01	J	3.5E+03		µg/L	FTA-TT-MW-03	5 / 24	0.17 - 40	3.5E+03	NA	1.1E+02	nc	1.0E+03	MCL	Yes	ASL
	156-60-5	trans-1,2-Dichloroethene	4.2E-01	J	5.8E-01	J	µg/L	JAW-60	2 / 24	0.15 - 40	5.8E-01	NA	6.8E+00	nc	1.0E+02	MCL	No	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Tapwater/Household Air (Domestic Use)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier		Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
	79-01-6	Trichloroethene	2.2E-01	J	8.2E+01	µg/L	JAW-61	7 / 24	0.16 - 40	8.2E+01	NA	2.8E-01	nc	5.0E+00	MCL	Yes	ASL
	75-01-4	Vinyl chloride	2.4E-01	J	5.1E+02	µg/L	FTA-TT-MW-03	5 / 24	0.1 - 20	5.1E+02	NA	1.9E-02	ca	2.0E+00	MCL	Yes	ASL
	XYLMP	Xylene, m,p-	1.9E-01	J	5.7E+02	µg/L	FTA-TT-MW-03	5 / 24	0.15 - 80	5.7E+02	NA	1.9E+01	nc	NA	NA	Yes	ASL
	95-47-6	Xylene, o-	1.4E+01		2.1E+02	µg/L	FTA-TT-MW-03	4 / 24	0.4 - 40	2.1E+02	NA	1.9E+01	nc	NA	NA	Yes	ASL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa* . Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Regional Screening Levels (RSL) for Tap Water (May 2023). Concentrations based on non-carcinogenic health effects are based on HQ=0.1.
The RSL for m-xylene was used for m,p-xylene.

(4) Values are the Federal Maximum Contaminant Levels (MCLs) and if no MCL was available, the EPA's (March 2018) Office of Water Lifetime Health Advisory (LHA) was provided.

(5) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
NA = not available
nc = noncarcinogenic
RDX = Royal Demolition Explosive
µg/L= microgram per liter

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Indoor Air	35572-78-2	2-Amino-4,6-dinitrotoluene	1.2E+00 J	1.2E+00 J	µg/L	SA-99-1	1 / 10	0.12 - 0.13	1.2E+00	NA	NSV	NA	NA	No	NSV
(Vapor Intrusion)	19406-51-0	4-Amino-2,6-dinitrotoluene	4.4E+00 J	4.4E+00 J	µg/L	SA-99-1	1 / 10	0.12 - 0.13	4.4E+00	NA	NSV	NA	NA	No	NSV
Fire Training Pit	2691-41-0	HMX	2.4E-01 J	4.5E-01 J	µg/L	FTA-TT-MW-05	2 / 10	0.09 - 0.21	4.5E-01	NA	NSV	NA	NA	No	NSV
	121-82-4	RDX	3.6E-01 J	5.1E+00 J	µg/L	SA-99-1	4 / 10	0.16 - 0.42	5.1E+00	NA	NSV	NA	NA	No	NSV
	7440-38-2	Arsenic	1.7E+01	5.6E+01	µg/L	SA-99-1	4 / 13	8 - 20	5.6E+01	3.3E+01	NSV	NA	NA	No	NSV
	7440-39-3	Barium	4.2E+01	2.0E+03	µg/L	FTA-TT-MW-02	13 / 13	1.8 - 9	2.0E+03	4.3E+02	NSV	NA	NA	No	NSV
	7782-49-2	Selenium	4.3E+00 J	4.3E+00 J	µg/L	JAW-62	1 / 13	2 - 20	4.3E+00	1.0E+01	NSV	NA	NA	No	NSV
	91-20-3	Naphthalene	3.7E+00	1.0E+01	µg/L	SA-99-1	2 / 24	0.8 - 80	1.0E+01	NA	1.1E+01 CA	NA	NA	No	BSL
	95-50-1	1,2-Dichlorobenzene	4.1E-01 J	4.1E-01 J	µg/L	FTA-TT-MW-04	1 / 24	0.15 - 40	4.1E-01	NA	5.7E+02 NC	NA	NA	No	BSL
	71-55-6	1,1,1-Trichloroethane	2.4E-01 J	2.0E+03	µg/L	FTA-TT-MW-03	11 / 24	0.16 - 40	2.0E+03	NA	1.2E+03 NC	NA	NA	Yes	ASL
	79-00-5	1,1,2-Trichloroethane	4.0E-01 J	2.5E+00 J	µg/L	JAW-60	4 / 24	0.27 - 80	2.5E+00	NA	1.2E+00 NC	NA	NA	Yes	ASL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.6E-01 J	5.1E+00 J	µg/L	SA-99-1	6 / 24	0.18 - 40	5.1E+00	NA	3.8E+01 NC	NA	NA	No	BSL
	75-34-3	1,1-Dichloroethane	5.8E-01 J	4.9E+03	µg/L	FTA-TT-MW-03	14 / 24	0.22 - 80	4.9E+03	NA	1.2E+01 CA	NA	NA	Yes	ASL
	75-35-4	1,1-Dichloroethene	1.4E+00 J	2.7E+02	µg/L	FTA-TT-MW-03	10 / 24	0.8 - 80	2.7E+02	NA	3.0E+01 NC	NA	NA	Yes	ASL
	95-63-6	1,2,4-Trimethylbenzene	3.3E-01 J	1.1E+02	µg/L	FTA-TT-MW-03	5 / 24	0.15 - 40	1.1E+02	NA	5.4E+01 NC	NA	NA	Yes	ASL
	107-06-2	1,2-Dichloroethane	8.2E-01 J	8.1E+01 J	µg/L	FTA-TT-MW-03	7 / 24	0.13 - 13	8.1E+01	NA	3.9E+00 CA	NA	NA	Yes	ASL
	108-67-8	1,3,5-Trimethylbenzene	4.7E+00	3.4E+01 J	µg/L	FTA-TT-MW-03	4 / 24	0.4 - 16	3.4E+01	NA	3.8E+01 NC	NA	NA	No	BSL
	99-87-6	4-Isopropyltoluene	4.9E-01 J	3.4E+00 J	µg/L	SA-99-1	2 / 24	0.2 - 40	3.4E+00	NA	NTX	NA	NA	No	NTX
	67-64-1	Acetone	2.0E+02	6.7E+03	µg/L	FTA-TT-MW-02	2 / 24	6.4 - 640	6.7E+03	NA	NTX	NA	NA	No	NTX
	71-43-2	Benzene	8.7E-01 J	8.8E+01 J	µg/L	FTA-TT-MW-03	7 / 24	0.16 - 16	8.8E+01	NA	2.7E+00 CA	NA	NA	Yes	ASL
	75-15-0	Carbon disulfide	2.6E+01 J	2.6E+01 J	µg/L	FTA-TT-MW-03	1 / 24	0.8 - 32	2.6E+01	NA	1.9E+02 NC	NA	NA	No	BSL
	75-00-3	Chloroethane	2.5E+00 J	1.1E+03	µg/L	FTA-TT-MW-03	6 / 24	1.6 - 160	1.1E+03	NA	1.3E+03 NC	NA	NA	No	BSL
	67-66-3	Chloroform	3.5E-01 J	3.5E-01 J	µg/L	JAW-80	1 / 24	0.16 - 16	3.5E-01	NA	1.3E+00 CA	NA	NA	No	BSL
	156-59-2	cis-1,2-Dichloroethene	4.5E-01 J	2.0E+03	µg/L	FTA-TT-MW-03	11 / 24	0.15 - 40	2.0E+03	NA	4.2E+01 NC	NA	NA	Yes	ASL
	100-41-4	Ethylbenzene	3.1E-01 J	1.3E+02	µg/L	FTA-TT-MW-03	6 / 24	0.16 - 40	1.3E+02	NA	6.9E+00 CA	NA	NA	Yes	ASL
	98-82-8	Isopropylbenzene	2.3E+00	3.9E+00 J	µg/L	SA-99-1	2 / 24	0.4 - 40	3.9E+00	NA	2.1E+02 NC	NA	NA	No	BSL
	78-93-3	Methyl ethyl ketone	4.4E+01 J	5.1E+03	µg/L	FTA-TT-MW-02	2 / 24	4 - 400	5.1E+03	NA	3.9E+05 NC	NA	NA	No	BSL
	108-10-1	Methyl isobutyl ketone	1.1E+02	1.7E+03	µg/L	FTA-TT-MW-02	2 / 24	3.2 - 320	1.7E+03	NA	1.1E+05 NC	NA	NA	No	BSL
	75-09-2	Methylene chloride	7.6E+00	1.6E+02 J	µg/L	FTA-TT-MW-02	3 / 24	2 - 200	1.6E+02	NA	7.4E+02 NC	NA	NA	No	BSL
	104-51-8	N-Butylbenzene	1.7E+00 J	1.7E+00 J	µg/L	SA-99-1	1 / 24	0.8 - 80	1.7E+00	NA	NTX	NA	NA	No	NTX
	103-65-1	N-Propylbenzene	2.2E-01 J	5.7E+00 J	µg/L	SA-99-1	3 / 24	0.16 - 40	5.7E+00	NA	5.2E+02 NC	NA	NA	No	BSL
	135-98-8	sec-Butylbenzene	1.7E-01 J	1.2E+00	µg/L	FTA-TT-MW-04	2 / 24	0.17 - 40	1.2E+00	NA	NTX	NA	NA	No	NTX
	127-18-4	Tetrachloroethene	3.8E-01 J	5.9E+01 J	µg/L	FTA-TT-MW-03	7 / 24	0.2 - 20	5.9E+01	NA	1.1E+01 NC	NA	NA	Yes	ASL

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Site Worker and Hypothetical Resident)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Minimum Qualifier	Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
	108-88-3	Toluene	1.8E-01	J	3.5E+03		µg/L	FTA-TT-MW-03	5 / 24	0.17 - 40	3.5E+03	NA	3.5E+03	NC	NA	NA	No	BSL
	156-60-5	trans-1,2-Dichloroethene	4.2E-01	J	5.8E-01	J	µg/L	JAW-60	2 / 24	0.15 - 40	5.8E-01	NA	1.8E+01	NC	NA	NA	No	BSL
	79-01-6	Trichloroethene	2.2E-01	J	8.2E+01		µg/L	JAW-61	7 / 24	0.16 - 40	8.2E+01	NA	9.0E-01	NC	NA	NA	Yes	ASL
	75-01-4	Vinyl chloride	2.4E-01	J	5.1E+02		µg/L	FTA-TT-MW-03	5 / 24	0.1 - 20	5.1E+02	NA	2.0E-01	CA	NA	NA	Yes	ASL
	XYLMP	Xylene, m,p-	1.9E-01	J	5.7E+02		µg/L	FTA-TT-MW-03	5 / 24	0.15 - 80	5.7E+02	NA	7.0E+01	NC	NA	NA	Yes	ASL
	95-47-6	Xylene, o-	1.4E+01		2.1E+02		µg/L	FTA-TT-MW-03	4 / 24	0.4 - 40	2.1E+02	NA	9.9E+01	NC	NA	NA	Yes	ASL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Residential Groundwater Vapor Intrusion Screening Level (May 2023). Concentration based on site specific groundwater temperature of 13°C and non-carcinogenic health effects are based on HQ=0.1.

(4) Rationale Codes:

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Not Sufficiently Volatile (NSV)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
NA = not available
nc = noncarcinogenic
RDX = Royal Demolition Explosive
µg/L= microgram per liter

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater in a Trench

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
Groundwater	35572-78-2	2-Amino-4,6-dinitrotoluene	1.2E+00	J	1.2E+00	J	µg/L	SA-99-1	1 / 5	0.12 - 0.12	1.2E+00	NA	1.9E-01	nc	NA	NA	Yes	ASL
Shallow Groundwater/Vapors	19406-51-0	4-Amino-2,6-dinitrotoluene	4.4E+00	J	4.4E+00	J	µg/L	SA-99-1	1 / 5	0.12 - 0.12	4.4E+00	NA	1.9E-01	nc	NA	NA	Yes	ASL
in a Trench	2691-41-0	HMX	4.5E-01	J	4.5E-01	J	µg/L	FTA-TT-MW-05	1 / 5	0.19 - 0.2	4.5E-01	NA	1.0E+02	nc	4.0E+02	LHA	No	BSL
Fire Training Pit	121-82-4	RDX	4.6E-01		5.1E+00	J	µg/L	SA-99-1	2 / 5	0.39 - 0.41	5.1E+00	NA	9.7E-01	ca	2.0E+00	LHA	Yes	ASL
	7440-38-2	Arsenic	1.7E+01		5.6E+01		µg/L	SA-99-1	4 / 10	8 - 20	5.6E+01	3.3E+01	5.2E-02	ca	1.0E+01	MCL	Yes	ASL
	7440-39-3	Barium	9.3E+01	J	2.0E+03		µg/L	FTA-TT-MW-02	10 / 10	1.8 - 9	2.0E+03	4.3E+02	3.8E+02	nc	2.0E+03	MCL	Yes	ASL
	7782-49-2	Selenium	4.3E+00	J	4.3E+00	J	µg/L	JAW-62	1 / 10	2 - 20	4.3E+00	1.0E+01	1.0E+01	nc	5.0E+01	MCL	No	BSL
	91-20-3	Naphthalene	3.7E+00		1.0E+01		µg/L	SA-99-1	2 / 14	0.8 - 80	1.0E+01	NA	1.2E-01	ca	1.0E+02	LHA	Yes	ASL
	95-50-1	1,2-Dichlorobenzene	4.1E-01	J	4.1E-01	J	µg/L	FTA-TT-MW-04	1 / 14	0.15 - 40	4.1E-01	NA	3.0E+01	nc	6.0E+02	MCL	No	BSL
	71-55-6	1,1,1-Trichloroethane	2.4E-01	J	2.0E+03		µg/L	FTA-TT-MW-03	6 / 14	0.16 - 40	2.0E+03	NA	8.0E+02	nc	2.0E+02	MCL	Yes	ASL
	79-00-5	1,1,2-Trichloroethane	6.4E-01	J	6.4E-01	J	µg/L	JAW-61	1 / 14	0.27 - 80	6.4E-01	NA	4.1E-02	nc	5.0E+00	MCL	Yes	ASL
	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	6.4E-01	J	5.1E+00	J	µg/L	SA-99-1	4 / 14	0.18 - 40	5.1E+00	NA	1.0E+03	nc	NA	NA	No	BSL
	75-34-3	1,1-Dichloroethane	5.8E-01	J	4.9E+03		µg/L	FTA-TT-MW-03	9 / 14	0.22 - 80	4.9E+03	NA	2.8E+00	ca	NA	NA	Yes	ASL
	75-35-4	1,1-Dichloroethene	1.4E+00	J	2.7E+02		µg/L	FTA-TT-MW-03	5 / 14	0.8 - 80	2.7E+02	NA	2.8E+01	nc	7.0E+00	MCL	Yes	ASL
	95-63-6	1,2,4-Trimethylbenzene	3.3E-01	J	1.1E+02		µg/L	FTA-TT-MW-03	5 / 14	0.15 - 40	1.1E+02	NA	5.6E+00	nc	NA	NA	Yes	ASL
	107-06-2	1,2-Dichloroethane	1.6E+00	J	8.1E+01	J	µg/L	FTA-TT-MW-03	5 / 14	0.4 - 13	8.1E+01	NA	1.7E-01	ca	5.0E+00	MCL	Yes	ASL
	108-67-8	1,3,5-Trimethylbenzene	4.7E+00		3.4E+01	J	µg/L	FTA-TT-MW-03	4 / 14	0.4 - 16	3.4E+01	NA	6.0E+00	nc	NA	NA	Yes	ASL
	99-87-6	4-Isopropyltoluene	4.9E-01	J	3.4E+00	J	µg/L	SA-99-1	2 / 14	0.2 - 40	3.4E+00	NA	NTX		NA	NA	No	NTX
	67-64-1	Acetone	2.0E+02		6.7E+03		µg/L	FTA-TT-MW-02	2 / 14	6.4 - 640	6.7E+03	NA	1.8E+03	nc	NA	NA	Yes	ASL
	71-43-2	Benzene	9.8E-01	J	8.8E+01	J	µg/L	FTA-TT-MW-03	6 / 14	0.16 - 16	8.8E+01	NA	4.6E-01	ca	5.0E+00	MCL	Yes	ASL
	75-15-0	Carbon disulfide	2.6E+01	J	2.6E+01	J	µg/L	FTA-TT-MW-03	1 / 14	0.8 - 32	2.6E+01	NA	8.1E+01	nc	NA	NA	No	BSL
	75-00-3	Chloroethane	2.5E+00	J	1.1E+03		µg/L	FTA-TT-MW-03	5 / 14	1.6 - 160	1.1E+03	NA	8.3E+02	nc	NA	NA	Yes	ASL
	67-66-3	Chloroform	3.5E-01	J	3.5E-01	J	µg/L	JAW-80	1 / 14	0.16 - 16	3.5E-01	NA	2.2E-01	ca	8.0E+01	MCL	Yes	ASL
	156-59-2	cis-1,2-Dichloroethene	1.0E+00	J	2.0E+03		µg/L	FTA-TT-MW-03	7 / 14	0.4 - 40	2.0E+03	NA	2.5E+00	nc	7.0E+01	MCL	Yes	ASL
	100-41-4	Ethylbenzene	3.1E-01	J	1.3E+02		µg/L	FTA-TT-MW-03	6 / 14	0.16 - 40	1.3E+02	NA	1.5E+00	ca	7.0E+02	MCL	Yes	ASL
	98-82-8	Isopropylbenzene	2.3E+00		3.9E+00	J	µg/L	SA-99-1	2 / 14	0.4 - 40	3.9E+00	NA	4.5E+01	nc	NA	NA	No	BSL
	78-93-3	Methyl ethyl ketone	4.4E+01	J	5.1E+03		µg/L	FTA-TT-MW-02	2 / 14	4 - 400	5.1E+03	NA	5.6E+02	nc	4.0E+03	LHA	Yes	ASL
	108-10-1	Methyl isobutyl ketone	1.1E+02		1.7E+03		µg/L	FTA-TT-MW-02	2 / 14	3.2 - 320	1.7E+03	NA	6.3E+02	nc	NA	NA	Yes	ASL
	75-09-2	Methylene chloride	7.6E+00		1.6E+02	J	µg/L	FTA-TT-MW-02	3 / 14	2 - 200	1.6E+02	NA	1.1E+01	nc	5.0E+00	MCL	Yes	ASL
	104-51-8	N-Butylbenzene	1.7E+00	J	1.7E+00	J	µg/L	SA-99-1	1 / 14	0.8 - 80	1.7E+00	NA	1.0E+02	nc	NA	NA	No	BSL
	103-65-1	N-Propylbenzene	2.2E-01	J	5.7E+00	J	µg/L	SA-99-1	3 / 14	0.16 - 40	5.7E+00	NA	6.6E+01	nc	NA	NA	No	BSL
	135-98-8	sec-Butylbenzene	1.7E-01	J	1.2E+00		µg/L	FTA-TT-MW-04	2 / 14	0.17 - 40	1.2E+00	NA	2.0E+02	nc	NA	NA	No	BSL
	127-18-4	Tetrachloroethene	3.8E-01	J	5.9E+01	J	µg/L	FTA-TT-MW-03	4 / 14	0.2 - 20	5.9E+01	NA	4.1E+00	nc	5.0E+00	MCL	Yes	ASL

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater in a Trench

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value (4)	Potential ARAR/TBC Source (4)	COPC Flag	Rationale for Selection or Deletion (5)
	108-88-3	Toluene	1.8E-01	J	3.5E+03		µg/L	FTA-TT-MW-03	5 / 14	0.17 - 40	3.5E+03	NA	1.1E+02	nc	1.0E+03	MCL	Yes	ASL
	156-60-5	trans-1,2-Dichloroethene	4.2E-01	J	4.2E-01	J	µg/L	FTA-TT-MW-04	1 / 14	0.15 - 40	4.2E-01	NA	6.8E+00	nc	1.0E+02	MCL	No	BSL
	79-01-6	Trichloroethene	2.8E+00	J	8.2E+01		µg/L	JAW-61	3 / 14	0.4 - 40	8.2E+01	NA	2.8E-01	nc	5.0E+00	MCL	Yes	ASL
	75-01-4	Vinyl chloride	2.4E-01	J	5.1E+02		µg/L	FTA-TT-MW-03	4 / 14	0.1 - 20	5.1E+02	NA	1.9E-02	ca	2.0E+00	MCL	Yes	ASL
	XYLMP	Xylene, m,p-	1.9E-01	J	5.7E+02		µg/L	FTA-TT-MW-03	5 / 14	0.15 - 80	5.7E+02	NA	1.9E+01	nc	NA	NA	Yes	ASL
	95-47-6	Xylene, o-	1.4E+01		2.1E+02		µg/L	FTA-TT-MW-03	4 / 14	0.4 - 40	2.1E+02	NA	1.9E+01	nc	NA	NA	Yes	ASL

Notes:

(1) Maximum concentration is used for screening.

(2) Source: *Evaluation of Background Concentrations of Metals in Groundwater, Iowa Army* Ammunition Plant, *Middletown, Iowa*. Prepared for U.S. Army Corps of Engineers Louisville District (CH2M, February 2020).

(3) Regional Screening Levels (RSL) for Tap Water (May 2023). Concentrations based on non-carcinogenic health effects are based on HQ=0.1.

(4) Values are the Federal Maximum Contaminant Levels (MCLs) and if no MCL was available, the EPA's (March 2018) Office of Water Lifetime Health Advisory (LHA) was provided.

(5) Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: Below Screening Level (BSL)
No Toxicity Information (NTX)

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = carcinogenic
COPC = Chemical of Potential Concern
HQ = hazard quotient
HMX = Hot Melt Explosive
J = compound was detected below the reporting limit in the sample
NA = not available
nc = noncarcinogenic
RDX = Royal Demolition Explosive
µg/L= microgram per liter

TABLE 3.1.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident and Site Worker)
Medium: Groundwater (RDX and VOC Plumes)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)		Exposure Point Concentration **			
							Value	Units	Statistic	Rationale
Tapwater/ Vapors in House (Domestic Use) Fire Training Pit	2-Amino-4,6-dinitrotoluene	µg/L	1.2E+00	NA	1.2E+00	J	1.2E+00	µg/L	RDX Plume Max	5
	4-Amino-2,6-dinitrotoluene	µg/L	4.4E+00	NA	4.4E+00	J	4.4E+00	µg/L	RDX Plume Max	5
	RDX	µg/L	5.1E+00	NA	5.1E+00	J	5.1E+00	µg/L	RDX Plume Max	5
	Arsenic	µg/L	2.9E+01	NA	5.6E+01		5.6E+01	µg/L	VOC Plume and RDX Plume Max	5
	Barium	µg/L	7.7E+02	NA	2.0E+03		2.0E+03	µg/L	VOC Plume and RDX Plume Max	5
	1,1,1-Trichloroethane	µg/L	2.4E+02	1.6E+03	2.0E+03		1.6E+03	µg/L	99% KM (Chebyshev) UCL	4
	1,1,2-Trichloroethane	µg/L	1.2E+00	1.2E+00	2.5E+00	J	1.2E+00	µg/L	95% KM (t) UCL	4
	1,1-Dichloroethane	µg/L	5.0E+02	8.3E+03	4.9E+03		4.9E+03	µg/L	VOC Plume Max	6
	1,1-Dichloroethene	µg/L	1.0E+02	1.0E+02	2.7E+02		1.0E+02	µg/L	95% KM (t) UCL	4
	1,2,4-Trimethylbenzene	µg/L	4.6E+01	3.3E+01	1.1E+02		3.3E+01	µg/L	95% KM (t) UCL	4
	1,2-Dichloroethane	µg/L	2.3E+01	2.3E+01	8.1E+01	J	2.3E+01	µg/L	95% KM (t) UCL	4
	1,3,5-Trimethylbenzene	µg/L	1.6E+01	1.0E+01	3.4E+01	J	1.0E+01	µg/L	95% KM (t) UCL	4
	Acetone	µg/L	3.5E+03	NA	6.7E+03		6.7E+03	µg/L	VOC Plume Max	5
	Benzene	µg/L	3.8E+01	3.5E+01	8.8E+01	J	3.5E+01	µg/L	95% KM (t) UCL	4
	Chloroethane	µg/L	3.6E+02	3.2E+02	1.1E+03		3.2E+02	µg/L	95% KM (t) UCL	4
	Chloroform	µg/L	3.5E-01	NA	3.5E-01	J	3.5E-01	µg/L	VOC Plume Max	5
	cis-1,2-Dichloroethene	µg/L	2.7E+02	1.8E+03	2.0E+03		1.8E+03	µg/L	95% KM Bootstrap t UCL	4
	Ethylbenzene	µg/L	4.5E+01	3.9E+01	1.3E+02		3.9E+01	µg/L	95% KM (t) UCL	4
	Methyl ethyl ketone	µg/L	2.6E+03	NA	5.1E+03		5.1E+03	µg/L	VOC Plume Max	5
	Methyl isobutyl ketone	µg/L	9.1E+02	NA	1.7E+03		1.7E+03	µg/L	VOC Plume Max	5
	Methylene chloride	µg/L	7.6E+01	NA	1.6E+02	J	1.6E+02	µg/L	VOC Plume Max	5
	Naphthalene	µg/L	6.9E+00	NA	1.0E+01		1.0E+01	µg/L	VOC Plume Max	5
	Tetrachloroethene	µg/L	1.3E+01	5.7E+01	5.9E+01	J	5.7E+01	µg/L	95% KM Bootstrap t UCL	4
	Toluene	µg/L	1.4E+03	1.0E+03	3.5E+03		1.0E+03	µg/L	95% KM (t) UCL	4
	Trichloroethene	µg/L	3.6E+01	2.7E+01	8.2E+01		2.7E+01	µg/L	95% KM (t) UCL	4
	Vinyl chloride	µg/L	1.1E+02	7.6E+03	5.1E+02		5.1E+02	µg/L	VOC Plume Max	6

TABLE 3.1.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident and Site Worker)
Medium: Groundwater (RDX and VOC Plumes)
Exposure Medium: Tapwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale
	Xylene, m,p-	µg/L	2.1E+02	1.6E+02	5.7E+02	1.6E+02	µg/L	95% KM (t) UCL	4
	Xylene, o-	µg/L	9.2E+01	5.8E+01	2.1E+02	5.8E+01	µg/L	95% KM (t) UCL	4

Notes:
EPA's ProUCL software (June 2016, Version 5.1.002) used to determine distribution of data (normal, lognormal, gamma distribution, or nonparametric) and estimate upper confidence limits (UCLs).
* Arithmetic mean of detected concentrations are presented.
** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the RDX plume: FTA-TT-MW-01, FTA-TT-MW-02, FTA-TT-MW-03, FTA-TT-MW-04, and SA-99-1.
Groundwater EPCs for VOCs were calculated using monitoring wells located within the core of the VOC plume: FTA-TT-MW-01, FTA-TT-MW-02, FTA-TT-MW-03, FTA-TT-MW-04, FTA-TT-MW-05, FTP-MW4, FTP-MW5, FTP-MW6, JAW-58, JAW-59, JAW-60, JAW-61, JAW-80, and SA-99-1. For arsenic and barium, the maximum detected concentration from the core of the RDX plume and VOC plume was used as the EPC.

Statistics:
KM Bootstrap t UCL: UCL based on Kaplan-Meier estimates using the boostrap method
KM (Chebyshev): UCL based on Kaplan-Meier estimates using the Chebyshev inequality
KM (t): UCL based on Kaplan-Meier estimates using the Student's t-distribution critical value

Rationale:
(1) Shapiro-Wilk W/Lilliefors Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W/Lilliefors Test indicates data are normally distributed.
(3) Anderson-Darling and/or Kolmogorov-Smirnov Tests indicate data are gamma distributed.
(4) Distribution tests are inconclusive; therefore, the nonparametric UCL was used as the EPC.
(5) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.
(6) The maximum detected concentration was used as the EPC because the UCL exceeds the maximum.

Acronyms:
EPC = Exposure Point Concentration
G = Gamma distribution
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.2.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident and Site Worker)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Indoor Air (Vapor Intrusion) Fire Training Pit	1,1,1-Trichloroethane	µg/L	2.4E+02	NA	2.0E+03	2.0E+03	µg/L	Sitewide Max	1
	1,1,2-Trichloroethane	µg/L	1.2E+00	NA	2.5E+00 J	2.5E+00	µg/L	Sitewide Max	1
	1,1-Dichloroethane	µg/L	5.0E+02	NA	4.9E+03	4.9E+03	µg/L	Sitewide Max	1
	1,1-Dichloroethene	µg/L	1.0E+02	NA	2.7E+02	2.7E+02	µg/L	Sitewide Max	1
	1,2,4-Trimethylbenzene	µg/L	4.6E+01	NA	1.1E+02	1.1E+02	µg/L	Sitewide Max	1
	1,2-Dichloroethane	µg/L	2.3E+01	NA	8.1E+01 J	8.1E+01	µg/L	Sitewide Max	1
	Benzene	µg/L	3.8E+01	NA	8.8E+01 J	8.8E+01	µg/L	Sitewide Max	1
	cis-1,2-Dichloroethene	µg/L	2.2E+02	NA	2.0E+03	2.0E+03	µg/L	Sitewide Max	1
	Ethylbenzene	µg/L	4.5E+01	NA	1.3E+02	1.3E+02	µg/L	Sitewide Max	1
	Tetrachloroethene	µg/L	1.3E+01	NA	5.9E+01 J	5.9E+01	µg/L	Sitewide Max	1
	Trichloroethene	µg/L	3.6E+01	NA	8.2E+01	8.2E+01	µg/L	Sitewide Max	1
	Vinyl chloride	µg/L	1.1E+02	NA	5.1E+02	5.1E+02	µg/L	Sitewide Max	1
	Xylene, m,p-	µg/L	2.1E+02	NA	5.7E+02	5.7E+02	µg/L	Sitewide Max	1
	Xylene, o-	µg/L	9.2E+01	NA	2.1E+02	2.1E+02	µg/L	Sitewide Max	1

Notes:
Statistics: Max - Maximum Detected Value

* Arithmetic mean of detected concentrations are presented.

(1) The maximum detected concentration was used as the EPC to evaluate the vapor intrusion pathway.

EPC = Exposure Point Concentration
J = result is estimated
NA = not applicable
UCL = Upper Confidence Limit
µg/L = microgram per liter

TABLE 3.2.RME SUPPLEMENT
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Hypothetical Resident and Site Worker)
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Point	Chemical of Potential Concern (1)	Exposure Point Concentration in Groundwater		Exposure Point Concentration in Indoor Air	
		Value (2)	Units	Value (3)	Units
Indoor Air (Vapor Intrusion) Fire Training Pit	1,1,1-Trichloroethane	2.0E+03	µg/L	8.4E+02	µg/m^3
	1,1,2-Trichloroethane	2.5E+00	µg/L	4.5E-02	µg/m^3
	1,1-Dichloroethane	4.9E+03	µg/L	6.9E+02	µg/m^3
	1,1-Dichloroethene	2.7E+02	µg/L	1.9E+02	µg/m^3
	1,2,4-Trimethylbenzene	1.1E+02	µg/L	1.3E+01	µg/m^3
	1,2-Dichloroethane	8.1E+01	µg/L	2.2E+00	µg/m^3
	Benzene	8.8E+01	µg/L	1.2E+01	µg/m^3
	cis-1,2-Dichloroethene	2.0E+03	µg/L	2.0E+02	µg/m^3
	Ethylbenzene	1.3E+02	µg/L	2.1E+01	µg/m^3
	Tetrachloroethene	5.9E+01	µg/L	2.3E+01	µg/m^3
	Trichloroethene	8.2E+01	µg/L	1.9E+01	µg/m^3
	Vinyl chloride	5.1E+02	µg/L	4.3E+02	µg/m^3
	Xylene, m,p-	5.7E+02	µg/L	8.5E+01	µg/m^3
	Xylene, o-	2.1E+02	µg/L	2.2E+01	µg/m^3

Notes:
(1) Chemicals of Potential Concern from Table 2.2.RME.
(2) Selection of exposure point concentration from Table 3.2.RME.
(3) The indoor air concentrations for groundwater-to-indoor air were estimated using the EPA's VISL Calculator, May 2023.
Site-specific groundwater temperature of 13 degrees C used to estimate indoor air concentrations.

µg/L = microgram per liter
µg/m^3 = microgram per cubic meter

TABLE 3.3.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater (RDX and VOC Plumes)
Exposure Medium: Shallow Groundwater in a Trench

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale
Groundwater Shallow Groundwater/Vapors in a Trench Fire Training Pit	2-Amino-4,6-dinitrotoluene	µg/L	1.2E+00	1.2E+00	1.2E+00 J	1.2E+00	µg/L	VOC Plume and RDX Plume Max	5
	4-Amino-2,6-dinitrotoluene	µg/L	4.4E+00	4.4E+00	4.4E+00 J	4.4E+00	µg/L	VOC Plume and RDX Plume Max	5
	RDX	µg/L	5.1E+00	5.1E+00	5.1E+00 J	5.1E+00	µg/L	VOC Plume and RDX Plume Max	5
	Arsenic	µg/L	3.3E+01	5.6E+01	5.6E+01	5.6E+01	µg/L	VOC Plume and RDX Plume Max	5
	Barium	µg/L	7.7E+02	2.0E+03	2.0E+03	2.0E+03	µg/L	VOC Plume and RDX Plume Max	5
	Naphthalene	µg/L	8.0E+00	1.0E+01	1.0E+01	1.0E+01	µg/L	VOC Plume and RDX Plume Max	5
	1,1,1-Trichloroethane	µg/L	2.3E+02	2.0E+03	2.0E+03	2.0E+03	µg/L	VOC Plume Max	6
	1,1,2-Trichloroethane	µg/L	7.0E+00	6.4E-01	6.4E-01 J	6.4E-01	µg/L	VOC Plume Max	5
	1,1-Dichloroethane	µg/L	6.0E+02	4.9E+03	4.9E+03	4.9E+03	µg/L	VOC Plume Max	6
	1,1-Dichloroethene	µg/L	4.9E+01	1.1E+02	2.7E+02	1.1E+02	µg/L	95% KM (t) UCL	4
	1,2,4-Trimethylbenzene	µg/L	3.1E+01	6.3E+01	1.1E+02	6.3E+01	µg/L	RDX Plume Max	5
	1,2-Dichloroethane	µg/L	1.4E+01	3.3E+01	8.1E+01 J	3.3E+01	µg/L	RDX Plume Max	5
	1,3,5-Trimethylbenzene	µg/L	7.7E+00	1.6E+01	3.4E+01 J	1.6E+01	µg/L	RDX Plume Max	5
	Acetone	µg/L	1.7E+03	6.7E+03	6.7E+03	6.7E+03	µg/L	VOC Plume and RDX Plume Max	5
	Benzene	µg/L	4.4E+01	8.2E+01	8.8E+01 J	8.2E+01	µg/L	RDX Plume Max	5
	Chloroethane	µg/L	2.7E+02	6.9E+02	1.1E+03	6.9E+02	µg/L	RDX Plume Max	5
	Chloroform	µg/L	1.8E+00	3.5E-01	3.5E-01 J	3.5E-01	µg/L	VOC Plume Max	5
	cis-1,2-Dichloroethene	µg/L	2.5E+02	2.0E+03	2.0E+03	2.0E+03	µg/L	VOC Plume Max	6
	Ethylbenzene	µg/L	3.5E+01	6.6E+01	1.3E+02	6.6E+01	µg/L	RDX Plume Max	5
	Methyl ethyl ketone	µg/L	1.3E+03	5.1E+03	5.1E+03	5.1E+03	µg/L	VOC Plume and RDX Plume Max	5
	Methyl isobutyl ketone	µg/L	4.5E+02	1.7E+03	1.7E+03	1.7E+03	µg/L	VOC Plume and RDX Plume Max	5
	Methylene chloride	µg/L	5.7E+01	1.6E+02	1.6E+02 J	1.6E+02	µg/L	VOC Plume and RDX Plume Max	5
	Tetrachloroethene	µg/L	1.1E+01	2.3E+01	5.9E+01 J	2.3E+01	µg/L	95% KM (t) UCL	4
	Toluene	µg/L	8.3E+02	1.9E+03	3.5E+03	1.9E+03	µg/L	RDX Plume Max	5
	Trichloroethene	µg/L	1.9E+01	8.2E+01	8.2E+01	8.2E+01	µg/L	VOC Plume Max	5
	Vinyl chloride	µg/L	6.3E+01	1.8E+02	5.1E+02	1.8E+02	µg/L	95% KM (t) UCL	4

TABLE 3.3.RME
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future (Construction/Utility Worker)
Medium: Shallow Groundwater (RDX and VOC Plumes)
Exposure Medium: Shallow Groundwater in a Trench

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean*	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration **			
						Value	Units	Statistic	Rationale
	Xylene, m,p-	µg/L	1.3E+02	2.7E+02	5.7E+02	2.7E+02	µg/L	RDX Plume Max	5
	Xylene, o-	µg/L	4.1E+01	8.9E+01	2.1E+02	8.9E+01	µg/L	95% KM (t) UCL	4

Notes:
EPA's ProUCL software (June 2022, Version 5.2) used to determine distribution of data (normal, lognormal, gamma distribution, or nonparametric) and estimate upper confidence limits (UCLs).
* Arithmetic mean of detected concentrations are presented.
** Groundwater EPCs for explosives were calculated using monitoring wells located within the core of the RDX plume: FTA-TT-MW-01, FTA-TT-MW-02, FTA-TT-MW-04, and SA-99-1.
Groundwater EPCs for VOCs were calculated using monitoring wells located within the core of the VOC plume: FTA-TT-MW-01, FTA-TT-MW-02, FTA-TT-MW-03, FTA-TT-MW-04, FTA-TT-MW-05, JAW-58, JAW-61, JAW-80, and SA-99-1.

Statistics:
Gamma Adjusted KM-UCL: UCL based on Kaplan-Meier estimates adjusted assuming gamma distribution
KM Bootstrap t UCL: UCL based on Kaplan-Meier estimates using the boostrap method
KM (Chebyshev): UCL based on Kaplan-Meier estimates using the Chebyshev inequality
KM (t): UCL based on Kaplan-Meier estimates using the Student's t-distribution critical value

Rationale:
(1) Shapiro-Wilk W/Lilliefors Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W/Lilliefors Test indicates data are normally distributed.
(3) Anderson-Darling and/or Kolmogorov-Smirnov Tests indicate data are gamma distributed.
(4) Distribution tests are inconclusive; therefore, the nonparametric UCL was used as the EPC.
(5) The maximum detected concentration was used as the EPC because there were less than 4 detected concentrations or less than 8 samples were collected.
(6) The maximum detected concentration was used as the EPC because the UCL exceeds the maximum.

Acronyms:
EPC = Exposure Point Concentration
G = Gamma distribution
J = chemical was detected below the reporting limit in the sample
NA = not applicable or not available
UCL = Upper Confidence Limit
ug/L = microgram per liter

TABLE 3.3 RME SUPPLEMENT

Calculation of Constituent Concentrations in Air from Trench Water Using VDEQ Model

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Exposure-point concentrations (inhalation) for construction workers in a trench: Groundwater less than 10 feet deep (1)	CAS No.	Molecular Weight MWi g/mol	Henry's Law Constant Hi atm-m^3/mol	Gas-Phase Mass Transfer Coefficient KiG cm/s	Liquid-Phase Mass Transfer Coefficient KiL cm/s	Overall Mass Transfer Coefficient Ki cm/s	Concentration of Contaminant in Groundwater Cgw ug/L	Volatilization Factor VF L/m^3	Concentration of Contaminant in Trench Ctrench ug/m^3	Concentration of Contaminant in Trench Ctrench mg/m^3
Naphthalene	91-20-3	128.18	4.4E-04	4.3E-01	9.9E-04	8.7E-04	1.0E+01	6.5E+00	6.5E+01	6.5E-02
1,1,1-Trichloroethane	71-55-6	133.41	1.7E-02	4.2E-01	9.7E-04	9.6E-04	2.0E+03	7.1E+00	1.4E+04	1.4E+01
1,1,2-Trichloroethane	79-00-5	133.41	8.2E-04	4.2E-01	9.7E-04	9.1E-04	6.4E-01	6.7E+00	4.3E+00	4.3E-03
1,1-Dichloroethane	75-34-3	98.96	5.6E-03	4.6E-01	1.1E-03	1.1E-03	4.9E+03	8.2E+00	4.0E+04	4.0E+01
1,1-Dichloroethene	75-35-4	96.94	2.6E-02	4.7E-01	1.1E-03	1.1E-03	1.1E+02	8.3E+00	8.9E+02	8.9E-01
1,2,4-Trimethylbenzene	95-63-6	120.20	6.2E-03	4.4E-01	1.0E-03	1.0E-03	6.3E+01	7.4E+00	4.7E+02	4.7E-01
1,2-Dichloroethane	107-06-2	98.96	1.2E-03	4.6E-01	1.1E-03	1.1E-03	3.3E+01	7.9E+00	2.6E+02	2.6E-01
1,3,5-Trimethylbenzene	108-67-8	120.20	8.8E-03	4.4E-01	1.0E-03	1.0E-03	1.6E+01	7.5E+00	1.2E+02	1.2E-01
Acetone	67-64-1	58.08	3.5E-05	5.6E-01	1.5E-03	5.2E-04	6.7E+03	3.8E+00	2.6E+04	2.6E+01
Benzene	71-43-2	78.12	5.6E-03	5.0E-01	1.3E-03	1.2E-03	8.2E+01	9.2E+00	7.6E+02	7.6E-01
Chloroethane	75-00-3	64.52	1.1E-02	5.4E-01	1.4E-03	1.4E-03	6.9E+02	1.0E+01	7.0E+03	7.0E+00
Chloroform	67-66-3	119.38	3.7E-03	4.4E-01	1.0E-03	1.0E-03	3.5E-01	7.4E+00	2.6E+00	2.6E-03
cis-1,2-Dichloroethene	156-59-2	96.94	4.1E-03	4.7E-01	1.1E-03	1.1E-03	2.0E+03	8.3E+00	1.7E+04	1.7E+01
Ethylbenzene	100-41-4	106.17	7.9E-03	4.5E-01	1.1E-03	1.1E-03	6.6E+01	7.9E+00	5.2E+02	5.2E-01
Methyl ethyl ketone	78-93-3	72.11	5.7E-05	5.2E-01	1.3E-03	6.3E-04	5.1E+03	4.7E+00	2.4E+04	2.4E+01
Methyl isobutyl ketone	108-10-1	100.16	1.4E-04	4.6E-01	1.1E-03	7.8E-04	1.7E+03	5.8E+00	9.8E+03	9.8E+00
Methylene chloride	75-09-2	84.93	3.3E-03	4.9E-01	1.2E-03	1.2E-03	1.6E+02	8.8E+00	1.4E+03	1.4E+00
Tetrachloroethene	127-18-4	165.83	1.8E-02	3.9E-01	8.7E-04	8.6E-04	2.3E+01	6.4E+00	1.5E+02	1.5E-01
Toluene	108-88-3	92.14	6.6E-03	4.8E-01	1.2E-03	1.2E-03	1.9E+03	8.5E+00	1.6E+04	1.6E+01
Trichloroethene	79-01-6	131.39	9.9E-03	4.2E-01	9.7E-04	9.7E-04	8.2E+01	7.1E+00	5.9E+02	5.9E-01
Vinyl chloride	75-01-4	62.50	2.8E-02	5.4E-01	1.4E-03	1.4E-03	1.8E+02	1.0E+01	1.8E+03	1.8E+00
Xylene, m,p-	108-38-3	106.17	7.2E-03	4.5E-01	1.1E-03	1.1E-03	2.7E+02	7.9E+00	2.1E+03	2.1E+00
Xylene, o-	95-47-6	106.17	5.2E-03	4.5E-01	1.1E-03	1.1E-03	8.9E+01	7.9E+00	7.0E+02	7.0E-01

(1) Site-specific.

VDEQ. Virginia Unified Risk Assessment Model. Appendix 3 Construction Worker Groundwater Trench Model. 2018.

$C_{trench} = C_{GW} \times VF$

C_{trench} = concentration of contaminant in the trench (ug/m^3)

C_{GW} = concentration of contaminant in groundwater (ug/L)

VF = volatilization factor (L/m^3)

TABLE 3.3 RME SUPPLEMENT

Calculation of Constituent Concentrations in Air from Trench Water Using VDEQ Model

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

For Mass-Transfer Coefficients

Kg,H_2O	0.833	cm/s
MWH_2O	18	
Kl,O_2	0.002	cm/s
MWO_2	32	
T	**70**	F
T	294	K
R	8.20E-05	atm-m^3/mol-K

For Emission Flux and Concentration in Trench

CF1	1.00E-03	L/cm^3
CF2	1.00E+04	cm^2/m^2
CF3	3600	s/hr
F	**1**	
ACH	2	hr^{-1}

Trench dimensions

Length	**8**	ft
	2.44	m
Width	**2.99**	ft
	0.91	m
Depth	**8**	ft
	2.44	m
Width/Depth	0.37	

VF = (K_i x A x F x 10^{-3} x 10^4 x 3600) / (ACH x V)

K_i = overall mass transfer coefficient of contaminant (cm/sec)

A = area of trench (m^2)

F = fraction of floor through which contaminant can enter (unitless)

ACH = air changes per hour (h^{-1})

V = volume of trench (m^3)

10^{-3} = conversion factor (L/cm^3)

10^4 = conversion factor (cm^2/m^2)

3600 = conversion factor (sec/hr)

Ki = 1 / {(1/kiL) + [(R T) / (Hi k_{iG})]}

kiL = liquid-phase mass transfer coefficient of i (cm/sec)

R = ideal gas constant (8.2 x 10^{-5} atm-m^3/mole-K)

T = average system Fahrenheit (F); average site groundwater temperature (68 F or 20 Celsius).

T = average system absolute temperature (298 K)

Hi = Henry's Law constant of i (atm-m^3/mol) from EPA Regional Screening Levels tables (May 2023)

k_{ig} = gas-phase mass transfer coefficient of i (cm/sec)

kiL = (MWO_2/MWi)0.5 x (T/298) x kL,O_2 (cm/sec)

MWO_2 = molecular weight of O_2 (g/mol)

MWi = molecular weight of component i (g/mol)

kL, O_2 = liquid-phase mass transfer coefficient of oxygen at 25oC (0.002 cm/sec)

k_{iG} = (MWH_2O/MWi)0.335 x (T/298)1.005 x kG, H_2O (cm/s)

MWH_2O = molecular weight of water (g/mol)

k_g, H_2O = gas-phase mass transfer coefficient of water vapor at 25oC (0.833 cm/sec)

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	2.5	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	0.78	L/day	EPA, 2014	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				BW	Body Weight	15	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W-Adj	Ingestion Rate of Water, Age-adjusted	0.94	liter-year/kg-day	Calculated	CW x IR-W-Adj x EF x CF1 x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2014	IR-W-Adj (liter-year/kd-day) =
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	(ED-C x IR-W-C / BW-C) + (ED-A x IR-W-A / BW-A)
	Site Worker	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	1	L/day	(5)	CW x IR-W x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 2014	
				ED	Exposure Duration	25	years	EPA, 2014	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Hypothetical Resident	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	19,652	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.71	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	80	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	
		Child	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,365	cm^2	EPA, 2014	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	Prof. Judgment	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.54	hr/event	EPA, 2014	x CF1 x CF2
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	
		Child/Adult Aggregate	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) = DA-Adj x EF x EV x 1/AT
				DA-Adj	Dermally Absorbed Dose, Age-adjusted	Calculated	mg-year/event-kg	Calculated	DA-Adj = (DAevent-A x SA-A x ED-A x 1/BW-A)
				EV	Event Frequency	1	events/day	EPA, 2004	+ (Daevent-C x SA-C x ED-C x 1/BW-C)
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
	Site Worker	Adult	Tapwater	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical-specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	chemical-specific	cm/hr	EPA, 2023	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical-specific	hr/event	EPA, 2023	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical-specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical-specific	dimensionless	EPA, 2023	Organics: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	2,500	cm^2	EPA, 2014 (3)	t_{event}<t*: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	EPA, 1991	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				t_{event}	Event Time	0.2	hr/event	(4)	x CF1 x CF2
				EF	Exposure Frequency	250	days/year	EPA, 2014	
				ED	Exposure Duration	25	years	EPA, 2014	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	80	kg	EPA, 2014	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.
(3) The SA for a site worker exposed to tap water is based on face, forearms, and hands.
(4) Based on best professional judgment (total of 12 minutes per day).
(5) March 1996 Interagency Agreement Dispute Resolution.

Sources:
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

cm/hr = Centimeter per hour
cm^2 = Square centimeter
mg/µg = Milligram per microgram
kg = Kilogram
L/cm^3 = Liter per cubic centimeter
L/day = Liter per day
mg/cm^2 -event = Milligram per square centimeter per event
mg/kg-day = Milligram per kilogram per day
µg/L = Microgram per liter

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Household Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Hypothetical Resident	Adult	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	Exposure Concentration (EC) (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	20	years	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	
		Child	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	EC (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				ED	Exposure Duration	6	years	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	
		Child/Adult Aggregate	Vapors in House (Domestic Use)	CW	Chemical Concentration in Water	See Table 3.1.RME	µg/L	See Table 3.1.RME	EC (mg/m^3) = CW x K x ET x ED x EF x CF1 x CF2 x 1/AT
				K	Andelman Volatilization Factor	0.5	L/m^3	EPA, 1991; EPA, 2023	
				EF	Exposure Frequency	350	days/year	EPA, 2014	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF1	Conversion Factor 1	1/24	day/hr	- -	
				CF2	Conversion Factor 2	0.001	mg/µg	- -	

Notes:

(1) Calculated as the product of ED (years) x 365 days/year.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 1991. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals). Office of Emergency and Remedial Response. EPA/540/R-92/003. December 1991.

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

L/m^3 = Liter per cubic meter
mg/m^3 = Milligram per cubic meter
µg/L = Microgram per liter

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Hypothetical Resident	Adult	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Indoor Air	See Table 3.2.RME Supp	mg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	20	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	7,300	days	(1)	
		Child	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	See Table 3.2.RME Supp	mg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	6	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
		Child/Adult Aggregate	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	See Table 3.2.RME Supp	mg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	24	hr/day	EPA, 2014	
				EF	Exposure Frequency	350	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration, Resident	26	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
	Site Worker	Adult	Indoor Air (Vapor Intrusion)	CW	Chemical Concentration in Water	See Table 3.2.RME	µg/L	See Table 3.2.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	See Table 3.2.RME Supp	mg/m^3	See Table 3.2.RME Supp	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	8	hr/day	EPA, 2014	
				EF	Exposure Frequency	250	days/year	EPA, 2014	CA calculated for groundwater to indoor air using an
				ED	Exposure Duration	25	years	EPA, 2014	attenuation factor of 0.001 and the temperature specific-

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Indoor Air (Vapor Intrusion)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
				CF	Conversion Factor	1/24	day/hour	- -	Henry's Law Constant. (EPA, 2023)
				AT-N	Averaging Time (Non-Cancer)	9,125	days	(1)	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

Notes:

(1) Calculated as the product of ED (years) x 365 days/year.

(2) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA, 2023: Vapor Intrusion Screening Levels (VISL) Calculator tool. May.

µg/L = microgram per liter

µg/m^3 = microgram per cubic meter

hr/day = hour per day

mg/m^3 = milligram per cubic meter

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction/Utility Worker	Adult	Shallow Groundwater in Trench	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/L	See Table 3.3.RME	Subchronic Daily Intake (SDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	0.0112	L/hour	EPA, 2019 (1)	CW x IR-W x EF x ED x ET x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	(2)	
				ED	Exposure Duration	0.033	years	(2)	
				ET	Exposure Time	1	hour/day	(2)	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	12	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
Dermal	Construction/Utility Worker	Adult	Shallow Groundwater in Trench	CW	Chemical Concentration in Water	See Table 3.3.RME	µg/L	See Table 3.3.RME	SDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	Calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				t_{event}	Event Time	1	hr/event	(2)	
				SA	Skin Surface Area Available for Contact	7,567	cm^2	EPA, 2011 (5)	Inorganics: DAevent (mg/cm^2-event) =
				EV	Event Frequency	1	events/day	(2)	Kp x CW x t_{event} x CF1 x CF2
				EF	Exposure Frequency	250	days/year	(2)	
				ED	Exposure Duration	0.033	years	(2)	
				BW	Body Weight	80	kg	EPA, 2014	
				AT-N	Averaging Time (Non-Cancer)	12	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				FA	Fraction absorbed water	Chemical-Specific	dimensionless	EPA, 2004	
				Kp	Permeability Coefficient	Chemical-Specific	cm/hr	EPA, 2023	
				τ	Lag Time	Chemical-Specific	hr/event	EPA, 2023	
				t*	Time to Reach Steady-state	Chemical-Specific	hours	EPA, 2023	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical-Specific	dimensionless	EPA, 2023	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	L/cm^3	- -	

Notes:

(1) This value is the upper confidence limit on the mean water ingestion rate while splashing, which is the type of activity expected if a worker has contact with shallow groundwater while performing repairs or maintenance activities on a culvert [Table 3-96 of the Exposure Factors Handbook (EPA, 2019)].

(2) Professional judgment assuming a worker would have contact with shallow groundwater while performing repairs or maintenance activities on a culvert for 1 hour a day, 6 days a week for 2 weeks per year.

(3) Calculated as the product of ED (years) x 365 days/year.

(4) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

(5) Skin surface area in contact with shallow groundwater assumed to be head, hands, forearms, lower legs, and feet (EPA, 2011).

Sources:

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

EPA, 2011. Exposure Factors Handbook: 2011 Edition. EPA/600/R-090/052F. September 2011.

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

EPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-18/259F, 2019.

TABLE 4.4.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Shallow Groundwater
Exposure Medium: Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

EPA, 2023: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

cm/hr = Centimeter per hour
cm^2 = Square centimeter
mg/µg = Milligram per microgram
kg = Kilogram
L/cm^3 = Liter per cubic centimeter
L/day = Liter per day
mg/cm^2 -event = Milligram per square centimeter per event
mg/kg-day = Milligram per kilogram per day
µg/L = Microgram per liter

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Medium: Shallow Groundwater
Exposure Medium: Trench Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction/Utility Worker	Adult	Vapors in Trench	CW	Chemical Concentration in Water	See Table 3.3.RME Supp	µg/L	See Table 3.3.RME Supp	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	Calculated	CA x ET x EF x ED x CF x 1/AT
				ET	Exposure Time	1	hr/day	(1)	
				EF	Exposure Frequency	250	days/year	(1)	CA calculated using the Construction Worker
				ED	Exposure Duration	0.033	years	(1)	Groundwater Trench Model provided in the Virginia
				CF	Conversion Factor	1/24	day/hour	- -	Unified Risk Assessment Model User's Guide
				AT-N	Averaging Time (Non-Cancer)	12	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	

Notes:

(1) Professional judgment assuming a worker would have contact with shallow groundwater while performing repairs or maintenance activities on a culvert for 1 hour a day, 6 days a week for 2 weeks per year.

(2) Calculated as the product of ED (years) x 365 days/year.

(3) Calculated as the product of 70 years assumed human lifetime (EPA, 2014) x 365 days/year.

Sources:

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.

hr/day = hours per day

mg/m^3 = Milligram per cubic meter

µg/L = Microgram per liter

TABLE 4 RME SUPPLEMENT
RECEPTOR-SPECIFIC EXPOSURE FACTORS FOR HYPOTHETICAL RESIDENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Receptor: Hypothetical Resident

					Water	
Age Group	Age-dependent Adjustment Factor (ADAF)	Exposure Frequency (EF)	Exposure Duration (ED)	Body Weight (BW)	Ingestion	IR-W-Adj
		(day/year)	(years)	(kg)	(L/day)	(L/kg)
Child (0-2)	10	350	2	15	0.78	364
Child (2-6)	3	350	4	15	0.78	218
Adolescent (6-16)	3	350	10	80	2.5	328
Adult (16-26)	1	350	10	80	2.5	109
Total			26			1,020

Equations
Ingestion (water): Total IR-W-Adj (MMOA) [L/kg} = Sum (ADAF x EF x ED x IR-S x 1/BW)

MMOA - Mutagenic mode of action
ADAF - Age-dependent Adjustment Factor
kg = Kilogram
L/day = Liter per day

Sources:
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 6, 2014.
EPA. 2019. Exposure Factors Handbook Chapter 3 (Update): Ingestion of Water and Other Select Liquids. U.S. EPA Office of Research and Development, Washington, DC, EPA/600/R-18/259F, 2019.

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
2-Amino-4,6-dinitrotoluene	Chronic	1.0E-04	mg/kg-day	100%	1.0E-04	mg/kg-day	Hepatic	3000	PPRTV X	06/05/2020
2-Amino-4,6-dinitrotoluene	Subchronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Hepatic	1000	PPRTV X	06/05/2020
4-Amino-2,6-dinitrotoluene	Chronic	1.0E-04	mg/kg-day	100%	1.0E-04	mg/kg-day	Hepatic	3000	PPRTV X	06/05/2020
4-Amino-2,6-dinitrotoluene	Subchronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Hepatic	1000	PPRTV X	06/05/2020
RDX	Chronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Nervous	300	IRIS	09/18/2023
RDX	Subchronic	1.0E-01	mg/kg-day	100%	1.0E-01	mg/kg-day	Neurological	30	ATSDR	8/1/2022
Arsenic	Chronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Cardiovascular, Dermal	3	IRIS	09/18/2023
Arsenic	Subchronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Dermal	3	HEAST	07/31/1997
Barium	Chronic	2.0E-01	mg/kg-day	7%	1.4E-02	mg/kg-day	Urinary	300	IRIS	09/18/2023
Barium	Subchronic	2.0E-01	mg/kg-day	7%	1.4E-02	mg/kg-day	Urinary	300	ATSDR	8/1/2022
1,1,1-Trichloroethane	Chronic	2.0E+00	mg/kg-day	100%	2.0E+00	mg/kg-day	Body Weight	1000	IRIS	09/18/2023
1,1,1-Trichloroethane	Subchronic	7.0E+00	mg/kg-day	100%	7.0E+00	mg/kg-day	Body Weight	300	IRIS	09/18/2023
1,1,2-Trichloroethane	Chronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Immune, Hematologic	1000	IRIS	09/18/2023
1,1,2-Trichloroethane	Subchronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Hepatic	1000	PPRTV	04/01/2011
1,1-Dichloroethane	Chronic	2.0E-01	mg/kg-day	100%	2.0E-01	mg/kg-day	Urinary	3000	PPRTV	09/27/2006
1,1-Dichloroethane	Subchronic	2.0E+00	mg/kg-day	100%	2.0E+00	mg/kg-day	Urinary	300	PPRTV	09/27/2006
1,1-Dichloroethene	Chronic	5.0E-02	mg/kg-day	100%	5.0E-02	mg/kg-day	Hepatic	100	IRIS	09/18/2023
1,1-Dichloroethene	Subchronic	9.0E-03	mg/kg-day	100%	9.0E-03	mg/kg-day	Hepatic	1000	HEAST	07/31/1997
1,2,4-Trimethylbenzene	Chronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Nervous	300	IRIS	09/18/2023
1,2,4-Trimethylbenzene	Subchronic	4.0E-02	mg/kg-day	100%	4.0E-02	mg/kg-day	Nervous	100	IRIS	09/18/2023
1,2-Dichloroethane	Chronic	6.0E-03	mg/kg-day	100%	6.0E-03	mg/kg-day	Urinary	10000	PPRTV X	10/01/2010
1,2-Dichloroethane	Subchronic	2.0E-02	mg/kg-day	100%	2.0E-02	mg/kg-day	Urinary	3000	PPRTV	10/01/2010
1,3,5-Trimethylbenzene	Chronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Nervous	300	IRIS	09/18/2023
1,3,5-Trimethylbenzene	Subchronic	4.0E-02	mg/kg-day	100%	4.0E-02	mg/kg-day	Nervous	100	IRIS	09/18/2023
Acetone	Chronic	9.0E-01	mg/kg-day	100%	9.0E-01	mg/kg-day	Urinary	1000	IRIS	09/18/2023
Acetone	Subchronic	6.0E-01	mg/kg-day	100%	6.0E-01	mg/kg-day	Hematologic	100	ATSDR	8/1/2022
Benzene	Chronic	4.0E-03	mg/kg-day	100%	4.0E-03	mg/kg-day	Immune	300	IRIS	09/18/2023
Benzene	Subchronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Immune	100	PPRTV	09/29/2009
Chloroethane	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	Subchronic	1.0E-01	mg/kg-day	100%	1.0E-02	mg/kg-day	Whole body	3000	PPRTV	07/24/2007
Chloroform	Chronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Hepatic	100	IRIS	09/18/2023
Chloroform	Subchronic	1.0E-01	mg/kg-day	100%	1.0E-01	mg/kg-day	Hepatic	100	ATSDR	8/1/2022
cis-1,2-Dichloroethene	Chronic	2.0E-03	mg/kg-day	100%	2.0E-03	mg/kg-day	Urinary	3000	IRIS	09/18/2023
cis-1,2-Dichloroethene	Subchronic	2.0E-02	mg/kg-day	100%	2.0E-02	mg/kg-day	Urinary	300	PPRTV	02/03/2011

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	100%	1.0E-01	mg/kg-day	Hepatic, Urinary	1000	IRIS	09/18/2023
Ethylbenzene	Subchronic	5.0E-02	mg/kg-day	100%	5.0E-02	mg/kg-day	Hepatic	1000	PPRTV	09/10/2009
Methyl ethyl ketone	Chronic	6.0E-01	mg/kg-day	100%	6.0E-01	mg/kg-day	Developmental	1000	IRIS	09/18/2023
Methyl ethyl ketone	Subchronic	2.0E+00	mg/kg-day	100%	2.0E+00	mg/kg-day	Developmental	1000	HEAST	07/31/1997
Methyl isobutyl ketone	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl isobutyl ketone	Subchronic	8.0E-01	mg/kg-day	100%	8.0E-01	mg/kg-day	Whole body, Urinary, Hepatic	300	HEAST	07/31/1997
Methylene chloride	Chronic	6.0E-03	mg/kg-day	100%	6.0E-03	mg/kg-day	Hepatic	30	IRIS	09/18/2023
Methylene chloride	Subchronic	6.0E-02	mg/kg-day	100%	6.0E-02	mg/kg-day	Hepatic	100	HEAST	07/31/1997
Naphthalene	Chronic	2.0E-02	mg/kg-day	58-89%	2.0E-02	mg/kg-day	Whole body	3000	IRIS	09/18/2023
Naphthalene	Subchronic	6.0E-01	mg/kg-day	58-89%	6.0E-01	mg/kg-day	Nervous	90	ATSDR	8/1/2022
Tetrachloroethene	Chronic	6.0E-03	mg/kg-day	100%	6.0E-03	mg/kg-day	Nervous, Ocular	1000	IRIS	09/18/2023
Tetrachloroethene	Subchronic	8.0E-03	mg/kg-day	100%	8.0E-03	mg/kg-day	Nervous	300	ATSDR	8/1/2022
Toluene	Chronic	8.0E-02	mg/kg-day	100%	8.0E-02	mg/kg-day	Urinary	3000	IRIS	09/18/2023
Toluene	Subchronic	8.0E-01	mg/kg-day	100%	8.0E-01	mg/kg-day	Urinary	300	PPRTV	09/29/2009
Trichloroethene	Chronic	5.0E-04	mg/kg-day	100%	5.0E-04	mg/kg-day	Developmental, Cardiovascular, Immune	10 - 1000	IRIS	09/18/2023
Trichloroethene	Subchronic	5.0E-04	mg/kg-day	100%	5.0E-04	mg/kg-day	Developmental, Immune	10 - 1000	ATSDR	8/1/2022
Vinyl chloride	Chronic	3.0E-03	mg/kg-day	100%	3.0E-03	mg/kg-day	Hepatic	30	IRIS	09/18/2023
Vinyl chloride	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, m,p- (3)	Chronic	2.0E-01	mg/kg-day	100%	2.0E-01	mg/kg-day	Body Weight, Longevity	1000	IRIS	09/18/2023
Xylene, m,p- (3)	Subchronic	4.0E-01	mg/kg-day	100%	4.0E-01	mg/kg-day	Whole Body	1000	PPRTV	09/30/2009
Xylene, o- (3)	Chronic	2.0E-01	mg/kg-day	100%	2.0E-01	mg/kg-day	Body Weight, Longevity	1000	IRIS	09/18/2023
Xylene, o- (3)	Subchronic	4.0E-01	mg/kg-day	100%	4.0E-01	mg/kg-day	Whole Body	1000	PPRTV	09/30/2009

Note:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) The RfD for xylenes was used for m,p-xylene and o-xylene.

Definitions:

ATSDR = Agency for Toxic Substances and Disease Registry
HEAST = Health Effects Summary Tables
IRIS = Integrated Risk Information System
NA = Not Available
NOE = No Observed Effect
PPRTV = Provisional Peer-Reviewed Toxicity Value
PPRTV X = PPRTV appendix screening toxicity value

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-Trichloroethane	Chronic	5.0E+00	mg/m^3	Hepatic	100	IRIS	09/18/2023
1,1,1-Trichloroethane	Subchronic	5.0E+00	mg/m^3	Hepatic	100	IRIS	09/18/2023
1,1,2-Trichloroethane	Chronic	2.0E-04	mg/m^3	Respiratory	3000	PPRTV X	04/01/2011
1,1,2-Trichloroethane	Subchronic	1.1E-02	mg/m^3	Respiratory	30	ATSDR	8/1/2022
1,1-Dichloroethane	Chronic	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	Subchronic	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	Chronic	2.0E-01	mg/m^3	Hepatic	30	IRIS	09/18/2023
1,1-Dichloroethene	Subchronic	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	Chronic	6.0E-02	mg/m^3	Nervous	300	IRIS	09/18/2023
1,2,4-Trimethylbenzene	Subchronic	2.0E-01	mg/m^3	Nervous	300	IRIS	09/18/2023
1,2-Dichloroethane	Chronic	7.0E-03	mg/m^3	Nervous	3000	PPRTV	10/01/2010
1,2-Dichloroethane	Subchronic	7.0E-02	mg/m^3	Nervous	300	PPRTV	10/01/2010
1,3,5-Trimethylbenzene	Chronic	6.0E-02	mg/m^3	Nervous	300	IRIS	09/18/2023
1,3,5-Trimethylbenzene	Subchronic	2.0E-01	mg/m^3	Nervous	300	IRIS	09/18/2023
Acetone	Chronic	NA	NA	NA	NA	NA	NA
Acetone	Subchronic	NA	NA	NA	NA	NA	NA
Benzene	Chronic	3.0E-02	mg/m^3	Immune	300	IRIS	09/18/2023
Benzene	Subchronic	8.0E-02	mg/m^3	Immune	100	PPRTV	09/29/2009
Chloroethane	Chronic	4.0E+00	mg/m^3	Reproductive	300	PPRTV	07/24/2007
Chloroethane	Subchronic	NA	NA	NA	NA	NA	NA
Chloroform	Chronic	9.8E-02	mg/m^3	Hepatic	100	ATSDR	8/1/2022
Chloroform	Subchronic	2.4E-01	mg/m^3	Hepatic	300	ATSDR	8/1/2022
cis-1,2-Dichloroethene	Chronic	4.0E-02	mg/m^3	Immune	3000	PPRTV X	09/21/2022
cis-1,2-Dichloroethene	Subchronic	4.0E-01	mg/m^3	Immune	300	PPRTV X	09/21/2022
Ethylbenzene	Chronic	1.0E+00	mg/m^3	Developmental	300	IRIS	09/18/2023
Ethylbenzene	Subchronic	9.0E+00	mg/m^3	Ear	100	PPRTV	09/10/2009
Methyl ethyl ketone	Chronic	5.0E+00	mg/m^3	Developmental, Musculoskeletal	300	IRIS	09/18/2023
Methyl ethyl ketone	Subchronic	1.0E+00	mg/m^3	Developmental	3000	HEAST	07/31/1997
Methyl isobutyl ketone	Chronic	3.0E+00	mg/m^3	Developmental, Musculoskeletal	300	IRIS	09/18/2023
Methyl isobutyl ketone	Subchronic	8.0E-01	mg/m^3	Hepatic, Urinary	100	HEAST	07/31/1997
Methylene chloride	Chronic	6.0E-01	mg/m^3	Hepatic	30	IRIS	09/18/2023
Methylene chloride	Subchronic	1.0E+00	mg/m^3	Hepatic	90	ATSDR	8/1/2022
Naphthalene	Chronic	3.0E-03	mg/m^3	Nervous, Respiratory	3000	IRIS	09/18/2023
Naphthalene	Subchronic	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Chronic	4.0E-02	mg/m^3	Nervous, Ocular	1000	IRIS	09/18/2023
Tetrachloroethene	Subchronic	4.1E-02	mg/m^3	Nervous	100	ATSDR	8/1/2022
Toluene	Chronic	5.0E+00	mg/m^3	Nervous	10	IRIS	09/18/2023

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Toluene	Subchronic	5.0E+00	mg/m^3	Nervous	10	PPRTV	09/29/2009
Trichloroethene	Chronic	2.0E-03	mg/m^3	Developmental, Cardiovascular, Immune	10-100	IRIS	09/18/2023
Trichloroethene	Subchronic	2.0E-03	mg/m^3	Developmental, Immune	10-100	ATSDR	8/1/2022
Vinyl chloride	Chronic	1.0E-01	mg/m^3	Hepatic	30 / 1	IRIS	09/18/2023
Vinyl chloride	Subchronic	8.0E-02	mg/m^3	Hepatic	30 / 1	ATSDR	8/1/2022
Xylene, m,p- (1)	Chronic	1.0E-01	mg/m^3	Nervous	300	IRIS	09/18/2023
Xylene, m,p- (1)	Subchronic	4.0E-01	mg/m^3	Whole Body	100	PPRTV	09/30/2009
Xylene, o- (1)	Chronic	1.0E-01	mg/m^3	Nervous	300	IRIS	09/18/2023
Xylene, o- (1)	Subchronic	4.0E-01	mg/m^3	Whole Body	100	PPRTV	09/30/2009

Note:

(1) The RfC for xylenes was used for m,p-xylene and o-xylene.

Definitions:

ATSDR = Agency for Toxic Substances and Disease Registry

HEAST = Health Effects Summary Tables

IRIS = Integrated Risk Information System

PPRTV = Provisional Peer-Reviewed Toxicity Value

PPRTV X = PPRTV appendix screening toxicity value

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
RDX	8.0E-02	$(mg/kg\text{-}day)^{-1}$	100%	8.0E-02	$(mg/kg\text{-}day)^{-1}$	Suggestive evidence of carcinogenic potential	IRIS	09/18/2023
Arsenic	1.5E+00	$(mg/kg\text{-}day)^{-1}$	95%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	09/18/2023
Barium	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.7E-02	$(mg/kg\text{-}day)^{-1}$	100%	5.7E-02	$(mg/kg\text{-}day)^{-1}$	C	IRIS	09/18/2023
1,1-Dichloroethane	5.7E-03	$(mg/kg\text{-}day)^{-1}$	100%	5.7E-03	$(mg/kg\text{-}day)^{-1}$	C	Cal EPA	09/18/2023
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	9.1E-02	$(mg/kg\text{-}day)^{-1}$	100%	9.1E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	09/18/2023
1,3,5-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.5E-02	$(mg/kg\text{-}day)^{-1}$	100%	5.5E-02	$(mg/kg\text{-}day)^{-1}$	Known/likely human carcinogen	IRIS	09/18/2023
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	3.1E-02	$(mg/kg\text{-}day)^{-1}$	100%	3.1E-02	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic to humans	Cal EPA	09/18/2023
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	1.1E-02	$(mg/kg\text{-}day)^{-1}$	100%	1.1E-02	$(mg/kg\text{-}day)^{-1}$	D	Cal EPA	09/18/2023
Methyl ethyl ketone	NA	NA	NA	NA	NA	NA	NA	NA
Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride (3)	2.0E-03	$(mg/kg\text{-}day)^{-1}$	100%	2.0E-03	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic to humans	IRIS	09/18/2023
Naphthalene	1.2E-01	$(mg/kg\text{-}day)^{-1}$	58-89%	1.2E-01	$(mg/kg\text{-}day)^{-1}$	Carcinogenic potential cannot be determined	Cal EPA	09/18/2023
Tetrachloroethene	2.1E-03	$(mg/kg\text{-}day)^{-1}$	100%	2.1E-03	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic to humans	IRIS	09/18/2023
Toluene	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene (3)	4.6E-02	$(mg/kg\text{-}day)^{-1}$	100%	4.6E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (Kidney) (3)	9.3E-03	$(mg/kg\text{-}day)^{-1}$	100%	9.3E-03	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (NHL + Liver)	3.7E-02	$(mg/kg\text{-}day)^{-1}$	100%	3.7E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Vinyl Chloride (Adulthood) (3)	7.2E-01	$(mg/kg\text{-}day)^{-1}$	100%	7.2E-01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	09/18/2023
Vinyl Chloride (From Birth) (3)	1.5E+00	$(mg/kg\text{-}day)^{-1}$	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	09/18/2023
Xylene, m,p-	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, o-	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 6.1

CANCER TOXICITY DATA -- ORAL/DERMAL

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral slope factor should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) Adjusted based on RAGS Part E.

(3) This chemical operates with a mutagenic mode of action (EPA, 2005) and would exhibit a greater effect in early-life versus later-life exposure. With the exception of vinyl chloride, chemical-specific toxicity data are not available for childhood and early-life exposures; thus, EPA (2005) default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<26	1

Definitions:
Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
NA = Not Available

Weight of Evidence definitions (EPA, 1986):

Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.

Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.

Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.

Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

TABLE 6.2

CANCER TOXICITY DATA -- INHALATION

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,1,1-Trichloroethane	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	1.6E-05	$(ug/m^3)^{-1}$	C	IRIS	09/18/2023
1,1-Dichloroethane	1.6E-06	$(ug/m^3)^{-1}$	C	Cal EPA	09/18/2023
1,1-Dichloroethene	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA
1,2-Dichloroethane	2.6E-05	$(ug/m^3)^{-1}$	B2	IRIS	09/18/2023
1,3,5-Trimethylbenzene	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA
Benzene	7.8E-06	$(ug/m^3)^{-1}$	Known/likely human carcinogen	IRIS	09/18/2023
Chloroethane	NA	NA	NA	NA	NA
Chloroform	2.3E-05	$(ug/m^3)^{-1}$	Likely to be carcinogenic to humans	IRIS	09/18/2023
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA
Ethylbenzene	2.5E-06	$(ug/m^3)^{-1}$	D	Cal EPA	09/18/2023
Methyl ethyl ketone	NA	NA	NA	NA	NA
Methyl isobutyl ketone	NA	NA	NA	NA	NA
Methylene chloride (1)	1.0E-08	$(ug/m^3)^{-1}$	Likely to be carcinogenic to humans	IRIS	09/18/2023
Naphthalene	3.4E-05	$(ug/m^3)^{-1}$	Carcinogenic potential cannot be determined	Cal EPA	09/18/2023
Tetrachloroethene	2.6E-07	$(ug/m^3)^{-1}$	Likely to be carcinogenic to humans	IRIS	09/18/2023
Toluene	NA	NA	NA	NA	NA
Trichloroethene (1)	4.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (kidney) (1)	1.0E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Trichloroethene (NHL + Liver)	3.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	09/18/2023
Vinyl Chloride (Adulthood) (1)	4.4E-06	$(ug/m^3)^{-1}$	A	IRIS	09/18/2023
Vinyl Chloride (From Birth) (1)	8.8E-06	$(ug/m^3)^{-1}$	A	IRIS	09/18/2023
Xylene, m,p-	NA	NA	NA	NA	NA
Xylene, o-	NA	NA	NA	NA	NA

Note:

(1) This chemical operates with a mutagenic mode of action (EPA, 2005) and would exhibit a greater effect in early-life versus later-life exposure. With the exception of vinyl chloride, chemical-specific toxicity data are not available for childhood and early-life exposures; 2005); thus, EPA (default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<26	1

Definitions: Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
NA = Not Available

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	1,1,1-Trichloroethane	8.4E+02	μg/m^3	NA	NA	NA	NA	NA	8.1E-01	mg/m^3	5.0E+00	mg/m3	1.6E-01
				1,1,2-Trichloroethane	4.5E-02	μg/m^3	NA	NA	NA	NA	NA	4.3E-05	mg/m^3	2.0E-04	mg/m3	2.1E-01
				1,1-Dichloroethane	6.9E+02	μg/m^3	NA	NA	NA	NA	NA	6.7E-01	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	1.9E+02	μg/m^3	NA	NA	NA	NA	NA	1.8E-01	mg/m^3	2.0E-01	mg/m3	9.1E-01
				1,2,4-Trimethylbenzene	1.3E+01	μg/m^3	NA	NA	NA	NA	NA	1.2E-02	mg/m^3	6.0E-02	mg/m3	2.0E-01
				1,2-Dichloroethane	2.2E+00	μg/m^3	NA	NA	NA	NA	NA	2.1E-03	mg/m^3	7.0E-03	mg/m3	3.1E-01
				Benzene	1.2E+01	μg/m^3	NA	NA	NA	NA	NA	1.1E-02	mg/m^3	3.0E-02	mg/m3	3.7E-01
				cis-1,2-Dichloroethene	2.0E+02	μg/m^3	NA	NA	NA	NA	NA	1.9E-01	mg/m^3	4.0E-02	mg/m3	4.8E+00
				Ethylbenzene	2.1E+01	μg/m^3	NA	NA	NA	NA	NA	2.0E-02	mg/m^3	1.0E+00	mg/m3	2.0E-02
				Tetrachloroethene	2.3E+01	μg/m^3	NA	NA	NA	NA	NA	2.2E-02	mg/m^3	4.0E-02	mg/m3	5.4E-01
				Trichloroethene	1.9E+01	μg/m^3	NA	NA	NA	NA	NA	1.8E-02	mg/m^3	2.0E-03	mg/m3	9.2E+00
				Vinyl chloride	4.3E+02	μg/m^3	NA	NA	NA	NA	NA	4.2E-01	mg/m^3	1.0E-01	mg/m3	4.2E+00
				Xylene, m,p-	8.5E+01	μg/m^3	NA	NA	NA	NA	NA	8.1E-02	mg/m^3	1.0E-01	mg/m3	8.1E-01
				Xylene, o-	2.2E+01	μg/m^3	NA	NA	NA	NA	NA	2.1E-02	mg/m^3	1.0E-01	mg/m3	2.1E-01
			Exp. Route Total								NA					2.2E+01
		Exposure Point Total									NA					2.2E+01
	Exposure Medium Total										NA					2.2E+01

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	NA	NA	NA	NA	NA	3.6E-05	mg/kg/day	1.0E-04	mg/kg/day	3.6E-01
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	NA	NA	NA	NA	NA	1.3E-04	mg/kg/day	1.0E-04	mg/kg/day	1.3E+00
				RDX	5.1E+00	µg/L	NA	NA	NA	NA	NA	1.5E-04	mg/kg/day	4.0E-03	mg/kg/day	3.8E-02
				Arsenic	5.6E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	3.0E-04	mg/kg/day	5.6E+00
				Barium	2.0E+03	µg/L	NA	NA	NA	NA	NA	6.0E-02	mg/kg/day	2.0E-01	mg/kg/day	3.0E-01
				1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	4.8E-02	mg/kg/day	2.0E+00	mg/kg/day	2.4E-02
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	3.5E-05	mg/kg/day	4.0E-03	mg/kg/day	8.7E-03
				1,1-Dichloroethane	4.9E+03	µg/L	NA	NA	NA	NA	NA	1.5E-01	mg/kg/day	2.0E-01	mg/kg/day	7.3E-01
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	3.0E-03	mg/kg/day	5.0E-02	mg/kg/day	6.0E-02
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.0E-03	mg/kg/day	1.0E-02	mg/kg/day	1.0E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	6.8E-04	mg/kg/day	6.0E-03	mg/kg/day	1.1E-01
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	3.0E-04	mg/kg/day	1.0E-02	mg/kg/day	3.0E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	2.0E-01	mg/kg/day	9.0E-01	mg/kg/day	2.2E-01
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.1E-03	mg/kg/day	4.0E-03	mg/kg/day	2.6E-01
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	9.6E-03	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	1.0E-05	mg/kg/day	1.0E-02	mg/kg/day	1.0E-03
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	5.5E-02	mg/kg/day	2.0E-03	mg/kg/day	2.7E+01
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	1.2E-03	mg/kg/day	1.0E-01	mg/kg/day	1.2E-02
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	1.5E-01	mg/kg/day	6.0E-01	mg/kg/day	2.5E-01
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	5.1E-02	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/kg/day	6.0E-03	mg/kg/day	8.0E-01
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	3.0E-04	mg/kg/day	2.0E-02	mg/kg/day	1.5E-02
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	6.0E-03	mg/kg/day	2.8E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	3.1E-02	mg/kg/day	8.0E-02	mg/kg/day	3.8E-01
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	8.1E-04	mg/kg/day	5.0E-04	mg/kg/day	1.6E+00
				Vinyl chloride	5.1E+02	µg/L	NA	NA	NA	NA	NA	1.5E-02	mg/kg/day	3.0E-03	mg/kg/day	5.1E+00
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/kg/day	2.0E-01	mg/kg/day	2.4E-02
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	2.0E-01	mg/kg/day	8.6E-03
			Exp. Route Total								NA					4.5E+01

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	NA	NA	NA	NA	NA	1.6E-06	mg/kg/day	1.0E-04	mg/kg/day	1.6E-02
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	NA	NA	NA	NA	NA	5.7E-06	mg/kg/day	1.0E-04	mg/kg/day	5.7E-02
				RDX	5.1E+00	µg/L	NA	NA	NA	NA	NA	1.3E-06	mg/kg/day	4.0E-03	mg/kg/day	3.2E-04
				Arsenic	5.6E+01	µg/L	NA	NA	NA	NA	NA	9.4E-06	mg/kg/day	3.0E-04	mg/kg/day	3.1E-02
				Barium	2.0E+03	µg/L	NA	NA	NA	NA	NA	3.3E-04	mg/kg/day	1.4E-02	mg/kg/day	2.4E-02
				1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	8.5E-03	mg/kg/day	2.0E+00	mg/kg/day	4.2E-03
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	2.5E-06	mg/kg/day	4.0E-03	mg/kg/day	6.2E-04
				1,1-Dichloroethane	4.9E+03	µg/L	NA	NA	NA	NA	NA	1.1E-02	mg/kg/day	2.0E-01	mg/kg/day	5.6E-02
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	3.9E-04	mg/kg/day	5.0E-02	mg/kg/day	7.8E-03
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.1E-03	mg/kg/day	1.0E-02	mg/kg/day	1.1E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	3.2E-05	mg/kg/day	6.0E-03	mg/kg/day	5.4E-03
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	2.4E-04	mg/kg/day	1.0E-02	mg/kg/day	2.4E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	9.3E-04	mg/kg/day	9.0E-01	mg/kg/day	1.0E-03
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.6E-04	mg/kg/day	4.0E-03	mg/kg/day	4.0E-02
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	5.5E-04	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	9.2E-07	mg/kg/day	1.0E-02	mg/kg/day	9.2E-05
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	6.7E-03	mg/kg/day	2.0E-03	mg/kg/day	3.3E+00
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	6.7E-04	mg/kg/day	1.0E-01	mg/kg/day	6.7E-03
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	6.0E-01	mg/kg/day	2.4E-03
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	1.8E-03	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	1.7E-04	mg/kg/day	6.0E-03	mg/kg/day	2.9E-02
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	1.9E-04	mg/kg/day	2.0E-02	mg/kg/day	9.5E-03
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	9.8E-04	mg/kg/day	6.0E-03	mg/kg/day	1.6E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	1.0E-02	mg/kg/day	8.0E-02	mg/kg/day	1.3E-01
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	1.3E-04	mg/kg/day	5.0E-04	mg/kg/day	2.6E-01
				Vinyl chloride	5.1E+02	µg/L	NA	NA	NA	NA	NA	1.2E-03	mg/kg/day	3.0E-03	mg/kg/day	3.9E-01
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	2.0E-01	mg/kg/day	1.4E-02
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	1.0E-03	mg/kg/day	2.0E-01	mg/kg/day	5.1E-03
			Exp. Route Total								NA					4.7E+00
		Exposure Point Total									NA					5.0E+01
	Exposure Medium Total										NA					5.0E+01

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	7.7E-01	mg/m^3	5.0E+00	mg/m3	1.5E-01
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	5.6E-04	mg/m^3	2.0E-04	mg/m3	2.8E+00
				1,1-Dichloroethane	3.4E+03	µg/L	NA	NA	NA	NA	NA	1.6E+00	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	4.8E-02	mg/m^3	2.0E-01	mg/m3	2.4E-01
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.6E-02	mg/m^3	6.0E-02	mg/m3	2.7E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	1.1E-02	mg/m^3	7.0E-03	mg/m3	1.6E+00
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/m^3	6.0E-02	mg/m3	8.0E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	3.2E+00	mg/m^3	3.1E+01	mg/m3	1.0E-01
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.7E-02	mg/m^3	3.0E-02	mg/m3	5.6E-01
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	1.5E-01	mg/m^3	4.0E+00	mg/m3	3.9E-02
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	1.7E-04	mg/m^3	9.8E-02	mg/m3	1.7E-03
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	8.8E-01	mg/m^3	4.0E-02	mg/m3	2.2E+01
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	1.8E-02	mg/m^3	1.0E+00	mg/m3	1.8E-02
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	2.4E+00	mg/m^3	5.0E+00	mg/m3	4.9E-01
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	7.7E-02	mg/m^3	6.0E-01	mg/m3	1.3E-01
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/m^3	3.0E-03	mg/m3	1.6E+00
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.7E-02	mg/m^3	4.0E-02	mg/m3	6.8E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	4.9E-01	mg/m^3	5.0E+00	mg/m3	9.8E-02
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	1.3E-02	mg/m^3	2.0E-03	mg/m3	6.5E+00
				Vinyl chloride	3.6E+02	µg/L	NA	NA	NA	NA	NA	1.7E-01	mg/m^3	1.0E-01	mg/m3	1.7E+00
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	7.7E-02	mg/m^3	1.0E-01	mg/m3	7.7E-01
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	2.8E-02	mg/m^3	1.0E-01	mg/m3	2.8E-01
			Exp. Route Total								NA					4.0E+01
		Exposure Point Total									NA					4.0E+01
	Exposure Medium Total										NA					4.0E+01
Groundwater Total											NA					1.1E+02
Receptor Total											NA					1E+02

TABLE 7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.1.RME SUPPLEMENT

CALCULATION OF DAEVENT

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
2-Amino-4,6-dinitrotoluene	1.2E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	6.6E-09	2
4-Amino-2,6-dinitrotoluene	4.4E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	2.4E-08	2
RDX	5.1E+00	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.71	5.4E-09	2
Arsenic	5.6E+01	1.0E-03	NA	NA	NA	NA	0.71	4.0E-08	1
Barium	2.0E+03	1.0E-03	NA	NA	NA	NA	0.71	1.4E-06	1
1,1,1-Trichloroethane	1.6E+03	1.3E-02	5.6E-02	5.9E-01	1.4E+00	1.0E+00	0.71	3.6E-05	2
1,1,2-Trichloroethane	1.2E+00	5.0E-03	2.2E-02	5.9E-01	1.4E+00	1.0E+00	0.71	1.0E-08	2
1,1-Dichloroethane	4.9E+03	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.71	4.7E-05	2
1,1-Dichloroethene	1.0E+02	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.71	1.6E-06	2
1,2,4-Trimethylbenzene	3.3E+01	8.6E-02	3.6E-01	5.0E-01	1.2E+00	1.0E+00	0.71	4.7E-06	2
1,2-Dichloroethane	2.3E+01	4.2E-03	1.6E-02	3.8E-01	9.0E-01	1.0E+00	0.71	1.4E-07	2
1,3,5-Trimethylbenzene	1.0E+01	6.2E-02	2.6E-01	5.0E-01	1.2E+00	1.0E+00	0.71	1.0E-06	2
Acetone	6.7E+03	5.1E-04	1.5E-03	2.2E-01	5.3E-01	1.0E+00	0.71	4.0E-06	3
Benzene	3.5E+01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.71	6.7E-07	3
Chloroethane	3.2E+02	6.1E-03	1.9E-02	2.4E-01	5.8E-01	1.0E+00	0.71	2.3E-06	3
Chloroform	3.5E-01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.71	3.9E-09	2
cis-1,2-Dichloroethene	1.8E+03	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.71	2.8E-05	2
Ethylbenzene	3.9E+01	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.71	2.8E-06	2
Methyl ethyl ketone	5.1E+03	9.6E-04	3.1E-03	2.7E-01	6.4E-01	1.0E+00	0.71	6.1E-06	3
Methyl isobutyl ketone	1.7E+03	3.2E-03	1.2E-02	3.8E-01	9.2E-01	1.0E+00	0.71	7.8E-06	2
Methylene chloride	1.6E+02	3.5E-03	1.3E-02	3.1E-01	7.5E-01	1.0E+00	0.71	7.4E-07	2
Naphthalene	1.0E+01	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.71	8.0E-07	2
Tetrachloroethene	5.7E+01	3.3E-02	1.7E-01	8.9E-01	2.1E+00	1.0E+00	0.71	4.2E-06	2
Toluene	1.0E+03	3.1E-02	1.1E-01	3.5E-01	8.3E-01	1.0E+00	0.71	4.4E-05	2
Trichloroethene	2.7E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.71	5.5E-07	2
Vinyl chloride	5.1E+02	8.4E-03	2.5E-02	2.4E-01	5.7E-01	1.0E+00	0.71	5.0E-06	3
Xylene, m,p-	1.6E+02	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.71	1.2E-05	2
Xylene, o-	5.8E+01	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.71	4.3E-06	2

TABLE 7.1.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \le t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Intake/Exposure Concentration Value	Cancer Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Intake/Exposure Concentration Value	Non-Cancer Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater	Indoor Air	Indoor Air	Inhalation	1,1,1-Trichloroethane	8.4E+02	µg/m^3	NA	NA	NA	NA	NA	8.1E-01	mg/m^3	5.0E+00	mg/m3	1.6E-01
	(Vapor Intrusion)	(Vapor Intrusion)		1,1,2-Trichloroethane	4.5E-02	µg/m^3	NA	NA	NA	NA	NA	4.3E-05	mg/m^3	2.0E-04	mg/m3	2.1E-01
				1,1-Dichloroethane	6.9E+02	µg/m^3	NA	NA	NA	NA	NA	6.7E-01	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	1.9E+02	µg/m^3	NA	NA	NA	NA	NA	1.8E-01	mg/m^3	2.0E-01	mg/m3	9.1E-01
				1,2,4-Trimethylbenzene	1.3E+01	µg/m^3	NA	NA	NA	NA	NA	1.2E-02	mg/m^3	6.0E-02	mg/m3	2.0E-01
				1,2-Dichloroethane	2.2E+00	µg/m^3	NA	NA	NA	NA	NA	2.1E-03	mg/m^3	7.0E-03	mg/m3	3.1E-01
				Benzene	1.2E+01	µg/m^3	NA	NA	NA	NA	NA	1.1E-02	mg/m^3	3.0E-02	mg/m3	3.7E-01
				cis-1,2-Dichloroethene	2.0E+02	µg/m^3	NA	NA	NA	NA	NA	1.9E-01	mg/m^3	4.0E-02	mg/m3	4.8E+00
				Ethylbenzene	2.1E+01	µg/m^3	NA	NA	NA	NA	NA	2.0E-02	mg/m^3	1.0E+00	mg/m3	2.0E-02
				Tetrachloroethene	2.3E+01	µg/m^3	NA	NA	NA	NA	NA	2.2E-02	mg/m^3	4.0E-02	mg/m3	5.4E-01
				Trichloroethene	1.9E+01	µg/m^3	NA	NA	NA	NA	NA	1.8E-02	mg/m^3	2.0E-03	mg/m3	9.2E+00
				Vinyl chloride	4.3E+02	µg/m^3	NA	NA	NA	NA	NA	4.2E-01	mg/m^3	1.0E-01	mg/m3	4.2E+00
				Xylene, m,p-	8.5E+01	µg/m^3	NA	NA	NA	NA	NA	8.1E-02	mg/m^3	1.0E-01	mg/m3	8.1E-01
				Xylene, o-	2.2E+01	µg/m^3	NA	NA	NA	NA	NA	2.1E-02	mg/m^3	1.0E-01	mg/m3	2.1E-01
			Exp. Route Total								NA					2.2E+01
		Exposure Point Total									NA					2.2E+01
	Exposure Medium Total										NA					2.2E+01

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	NA	NA	NA	NA	NA	6.0E-05	mg/kg/day	1.0E-04	mg/kg/day	6.0E-01
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	NA	NA	NA	NA	NA	2.2E-04	mg/kg/day	1.0E-04	mg/kg/day	2.2E+00
				RDX	5.1E+00	µg/L	NA	NA	NA	NA	NA	2.5E-04	mg/kg/day	4.0E-03	mg/kg/day	6.4E-02
				Arsenic	5.6E+01	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	3.0E-04	mg/kg/day	9.3E+00
				Barium	2.0E+03	µg/L	NA	NA	NA	NA	NA	1.0E-01	mg/kg/day	2.0E-01	mg/kg/day	5.0E-01
				1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	8.0E-02	mg/kg/day	2.0E+00	mg/kg/day	4.0E-02
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	5.8E-05	mg/kg/day	4.0E-03	mg/kg/day	1.4E-02
				1,1-Dichloroethane	4.9E+03	µg/L	NA	NA	NA	NA	NA	2.4E-01	mg/kg/day	2.0E-01	mg/kg/day	1.2E+00
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	5.0E-03	mg/kg/day	5.0E-02	mg/kg/day	1.0E-01
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	1.0E-02	mg/kg/day	1.7E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	1.1E-03	mg/kg/day	6.0E-03	mg/kg/day	1.9E-01
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	5.0E-04	mg/kg/day	1.0E-02	mg/kg/day	5.0E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	3.3E-01	mg/kg/day	9.0E-01	mg/kg/day	3.7E-01
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.8E-03	mg/kg/day	4.0E-03	mg/kg/day	4.4E-01
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	1.6E-02	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	1.7E-05	mg/kg/day	1.0E-02	mg/kg/day	1.7E-03
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	9.1E-02	mg/kg/day	2.0E-03	mg/kg/day	4.6E+01
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	1.9E-03	mg/kg/day	1.0E-01	mg/kg/day	1.9E-02
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	2.5E-01	mg/kg/day	6.0E-01	mg/kg/day	4.2E-01
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	8.5E-02	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	8.0E-03	mg/kg/day	6.0E-03	mg/kg/day	1.3E+00
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	5.0E-04	mg/kg/day	2.0E-02	mg/kg/day	2.5E-02
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	6.0E-03	mg/kg/day	4.7E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	5.1E-02	mg/kg/day	8.0E-02	mg/kg/day	6.4E-01
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	2.7E+00
				Vinyl chloride	5.1E+02	µg/L	NA	NA	NA	NA	NA	2.5E-02	mg/kg/day	3.0E-03	mg/kg/day	8.5E+00
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	8.0E-03	mg/kg/day	2.0E-01	mg/kg/day	4.0E-02
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	2.9E-03	mg/kg/day	2.0E-01	mg/kg/day	1.4E-02
			Exp. Route Total								NA					7.5E+01

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	2-Amino-4,6-dinitrotoluene	1.20E+00	µg/L	NA	NA	NA	NA	NA	2.3E-06	mg/kg/day	1.0E-04	mg/kg/day	2.3E-02
				4-Amino-2,6-dinitrotoluene	4.40E+00	µg/L	NA	NA	NA	NA	NA	8.6E-06	mg/kg/day	1.0E-04	mg/kg/day	8.6E-02
				RDX	5.10E+00	µg/L	NA	NA	NA	NA	NA	1.9E-06	mg/kg/day	4.0E-03	mg/kg/day	4.8E-04
				Arsenic	5.60E+01	µg/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	4.1E-02
				Barium	2.00E+03	µg/L	NA	NA	NA	NA	NA	4.4E-04	mg/kg/day	1.4E-02	mg/kg/day	3.1E-02
				1,1,1-Trichloroethane	1.60E+03	µg/L	NA	NA	NA	NA	NA	1.3E-02	mg/kg/day	2.0E+00	mg/kg/day	6.4E-03
				1,1,2-Trichloroethane	1.16E+00	µg/L	NA	NA	NA	NA	NA	3.7E-06	mg/kg/day	4.0E-03	mg/kg/day	9.3E-04
				1,1-Dichloroethane	4.90E+03	µg/L	NA	NA	NA	NA	NA	1.7E-02	mg/kg/day	2.0E-01	mg/kg/day	8.4E-02
				1,1-Dichloroethene	9.99E+01	µg/L	NA	NA	NA	NA	NA	5.9E-04	mg/kg/day	5.0E-02	mg/kg/day	1.2E-02
				1,2,4-Trimethylbenzene	3.35E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	1.0E-02	mg/kg/day	1.7E-01
				1,2-Dichloroethane	2.28E+01	µg/L	NA	NA	NA	NA	NA	4.8E-05	mg/kg/day	6.0E-03	mg/kg/day	8.1E-03
				1,3,5-Trimethylbenzene	9.96E+00	µg/L	NA	NA	NA	NA	NA	3.6E-04	mg/kg/day	1.0E-02	mg/kg/day	3.6E-02
				Acetone	6.70E+03	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	9.0E-01	mg/kg/day	1.5E-03
				Benzene	3.52E+01	µg/L	NA	NA	NA	NA	NA	2.3E-04	mg/kg/day	4.0E-03	mg/kg/day	5.8E-02
				Chloroethane	3.22E+02	µg/L	NA	NA	NA	NA	NA	7.9E-04	mg/kg/day	NA	NA	NA
				Chloroform	3.50E-01	µg/L	NA	NA	NA	NA	NA	1.4E-06	mg/kg/day	1.0E-02	mg/kg/day	1.4E-04
				cis-1,2-Dichloroethene	1.83E+03	µg/L	NA	NA	NA	NA	NA	1.0E-02	mg/kg/day	2.0E-03	mg/kg/day	5.0E+00
				Ethylbenzene	3.85E+01	µg/L	NA	NA	NA	NA	NA	1.0E-03	mg/kg/day	1.0E-01	mg/kg/day	1.0E-02
				Methyl ethyl ketone	5.10E+03	µg/L	NA	NA	NA	NA	NA	2.1E-03	mg/kg/day	6.0E-01	mg/kg/day	3.5E-03
				Methyl isobutyl ketone	1.70E+03	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	NA	NA	NA
				Methylene chloride	1.60E+02	µg/L	NA	NA	NA	NA	NA	2.6E-04	mg/kg/day	6.0E-03	mg/kg/day	4.4E-02
				Naphthalene	1.00E+01	µg/L	NA	NA	NA	NA	NA	2.9E-04	mg/kg/day	2.0E-02	mg/kg/day	1.4E-02
				Tetrachloroethene	5.67E+01	µg/L	NA	NA	NA	NA	NA	1.5E-03	mg/kg/day	6.0E-03	mg/kg/day	2.5E-01
				Toluene	1.03E+03	µg/L	NA	NA	NA	NA	NA	1.5E-02	mg/kg/day	8.0E-02	mg/kg/day	1.9E-01
				Trichloroethene	2.71E+01	µg/L	NA	NA	NA	NA	NA	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day	3.9E-01
				Vinyl chloride	5.10E+02	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	3.0E-03	mg/kg/day	5.7E-01
				Xylene, m,p-	1.60E+02	µg/L	NA	NA	NA	NA	NA	4.2E-03	mg/kg/day	2.0E-01	mg/kg/day	2.1E-02
				Xylene, o-	5.77E+01	µg/L	NA	NA	NA	NA	NA	1.5E-03	mg/kg/day	2.0E-01	mg/kg/day	7.7E-03
			Exp. Route Total								NA					7.1E+00
		Exposure Point Total									NA					8.2E+01
	Exposure Medium Total										NA					8.2E+01

TABLE 7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	7.7E-01	mg/m^3	5.0E+00	mg/m3	1.5E-01
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	5.6E-04	mg/m^3	2.0E-04	mg/m3	2.8E+00
				1,1-Dichloroethane	3.4E+03	µg/L	NA	NA	NA	NA	NA	1.6E+00	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	4.8E-02	mg/m^3	2.0E-01	mg/m3	2.4E-01
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.6E-02	mg/m^3	6.0E-02	mg/m3	2.7E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	1.1E-02	mg/m^3	7.0E-03	mg/m3	1.6E+00
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/m^3	6.0E-02	mg/m3	8.0E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	3.2E+00	mg/m^3	3.1E+01	mg/m3	1.0E-01
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.7E-02	mg/m^3	3.0E-02	mg/m3	5.6E-01
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	1.5E-01	mg/m^3	4.0E+00	mg/m3	3.9E-02
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	1.7E-04	mg/m^3	9.8E-02	mg/m3	1.7E-03
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	8.8E-01	mg/m^3	4.0E-02	mg/m3	2.2E+01
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	1.8E-02	mg/m^3	1.0E+00	mg/m3	1.8E-02
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	2.4E+00	mg/m^3	5.0E+00	mg/m3	4.9E-01
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	8.2E-01	mg/m^3	3.0E+00	mg/m3	2.7E-01
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	7.7E-02	mg/m^3	6.0E-01	mg/m3	1.3E-01
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/m^3	3.0E-03	mg/m3	1.6E+00
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.7E-02	mg/m^3	4.0E-02	mg/m3	6.8E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	4.9E-01	mg/m^3	5.0E+00	mg/m3	9.8E-02
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	1.3E-02	mg/m^3	2.0E-03	mg/m3	6.5E+00
				Vinyl chloride	3.6E+02	µg/L	NA	NA	NA	NA	NA	1.7E-01	mg/m^3	1.0E-01	mg/m3	1.7E+00
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	7.7E-02	mg/m^3	1.0E-01	mg/m3	7.7E-01
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	2.8E-02	mg/m^3	1.0E-01	mg/m3	2.8E-01
			Exp. Route Total								NA					4.0E+01
		Exposure Point Total									NA					4.0E+01
	Exposure Medium Total										NA					4.0E+01
Groundwater Total											NA					1.4E+02
Receptor Total											NA					1E+02

TABLE 7.2.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
2-Amino-4,6-dinitrotoluene	1.2E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	5.7E-09	2
4-Amino-2,6-dinitrotoluene	4.4E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	2.1E-08	2
RDX	5.1E+00	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.54	4.7E-09	2
Arsenic	5.6E+01	1.0E-03	NA	NA	NA	NA	0.54	3.0E-08	1
Barium	2.0E+03	1.0E-03	NA	NA	NA	NA	0.54	1.1E-06	1
1,1,1-Trichloroethane	1.6E+03	1.3E-02	5.6E-02	5.9E-01	1.4E+00	1.0E+00	0.54	3.1E-05	2
1,1,2-Trichloroethane	1.2E+00	5.0E-03	2.2E-02	5.9E-01	1.4E+00	1.0E+00	0.54	9.1E-09	2
1,1-Dichloroethane	4.9E+03	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.54	4.1E-05	2
1,1-Dichloroethene	1.0E+02	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.54	1.4E-06	2
1,2,4-Trimethylbenzene	3.3E+01	8.6E-02	3.6E-01	5.0E-01	1.2E+00	1.0E+00	0.54	4.1E-06	2
1,2-Dichloroethane	2.3E+01	4.2E-03	1.6E-02	3.8E-01	9.0E-01	1.0E+00	0.54	1.2E-07	2
1,3,5-Trimethylbenzene	1.0E+01	6.2E-02	2.6E-01	5.0E-01	1.2E+00	1.0E+00	0.54	8.8E-07	2
Acetone	6.7E+03	5.1E-04	1.5E-03	2.2E-01	5.3E-01	1.0E+00	0.54	3.4E-06	3
Benzene	3.5E+01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.54	5.7E-07	2
Chloroethane	3.2E+02	6.1E-03	1.9E-02	2.4E-01	5.8E-01	1.0E+00	0.54	2.0E-06	2
Chloroform	3.5E-01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.54	3.4E-09	2
cis-1,2-Dichloroethene	1.8E+03	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.54	2.5E-05	2
Ethylbenzene	3.9E+01	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.54	2.5E-06	2
Methyl ethyl ketone	5.1E+03	9.6E-04	3.1E-03	2.7E-01	6.4E-01	1.0E+00	0.54	5.1E-06	2
Methyl isobutyl ketone	1.7E+03	3.2E-03	1.2E-02	3.8E-01	9.2E-01	1.0E+00	0.54	6.8E-06	2
Methylene chloride	1.6E+02	3.5E-03	1.3E-02	3.1E-01	7.5E-01	1.0E+00	0.54	6.5E-07	2
Naphthalene	1.0E+01	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.54	7.0E-07	2
Tetrachloroethene	5.7E+01	3.3E-02	1.7E-01	8.9E-01	2.1E+00	1.0E+00	0.54	3.6E-06	2
Toluene	1.0E+03	3.1E-02	1.1E-01	3.5E-01	8.3E-01	1.0E+00	0.54	3.8E-05	2
Trichloroethene	2.7E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.54	4.8E-07	2
Vinyl chloride	5.1E+02	8.4E-03	2.5E-02	2.4E-01	5.7E-01	1.0E+00	0.54	4.2E-06	2
Xylene, m,p-	1.6E+02	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.54	1.0E-05	2
Xylene, o-	5.8E+01	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.54	3.8E-06	2

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

TABLE 7.2.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air	Indoor Air	Inhalation	1,1,1-Trichloroethane	8.4E+02	µg/m^3	3.0E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
	(Vapor Intrusion)	(Vapor Intrusion)		1,1,2-Trichloroethane	4.5E-02	µg/m^3	1.6E-05	mg/m^3	1.6E-05	1/(ug/m3)	2.5E-07	NA	NA	NA	NA	NA
				1,1-Dichloroethane	6.9E+02	µg/m^3	2.5E-01	mg/m^3	1.6E-06	1/(ug/m3)	4.0E-04	NA	NA	NA	NA	NA
				1,1-Dichloroethene	1.9E+02	µg/m^3	6.8E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,2,4-Trimethylbenzene	1.3E+01	µg/m^3	4.5E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,2-Dichloroethane	2.2E+00	µg/m^3	7.9E-04	mg/m^3	2.6E-05	1/(ug/m3)	2.1E-05	NA	NA	NA	NA	NA
				Benzene	1.2E+01	µg/m^3	4.2E-03	mg/m^3	7.8E-06	1/(ug/m3)	3.3E-05	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	2.0E+02	µg/m^3	7.2E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	2.1E+01	µg/m^3	7.6E-03	mg/m^3	2.5E-06	1/(ug/m3)	1.9E-05	NA	NA	NA	NA	NA
				Tetrachloroethene	2.3E+01	µg/m^3	8.1E-03	mg/m^3	2.6E-07	1/(ug/m3)	2.1E-06	NA	NA	NA	NA	NA
				Trichloroethene	1.9E+01	µg/m^3	6.8E-03	mg/m^3	4.1E-06	1/(ug/m3)	4.0E-05	NA	NA	NA	NA	NA
				Vinyl chloride	4.3E+02	µg/m^3	1.5E-01	mg/m^3	8.8E-06	1/(ug/m3)	8.4E-04	NA	NA	NA	NA	NA
				Xylene, m,p-	8.5E+01	µg/m^3	3.0E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Xylene, o-	2.2E+01	µg/m^3	7.9E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								1.3E-03					NA
		Exposure Point Total									1.3E-03					NA
	Exposure Medium Total										1.3E-03					NA

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	1.5E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	5.6E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	5.1E+00	µg/L	6.5E-05	mg/kg/day	8.0E-02	1/(mg/kg/day)	5.2E-06	NA	NA	NA	NA	NA
				Arsenic	5.6E+01	µg/L	7.2E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.1E-03	NA	NA	NA	NA	NA
				Barium	2.0E+03	µg/L	2.6E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1,1-Trichloroethane	1.6E+03	µg/L	2.1E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1,2-Trichloroethane	1.2E+00	µg/L	1.5E-05	mg/kg/day	5.7E-02	1/(mg/kg/day)	8.5E-07	NA	NA	NA	NA	NA
				1,1-Dichloroethane	4.9E+03	µg/L	6.3E-02	mg/kg/day	5.7E-03	1/(mg/kg/day)	3.6E-04	NA	NA	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	1.3E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	4.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,2-Dichloroethane	2.3E+01	µg/L	2.9E-04	mg/kg/day	9.1E-02	1/(mg/kg/day)	2.7E-05	NA	NA	NA	NA	NA
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	1.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Acetone	6.7E+03	µg/L	8.6E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	3.5E+01	µg/L	4.5E-04	mg/kg/day	5.5E-02	1/(mg/kg/day)	2.5E-05	NA	NA	NA	NA	NA
				Chloroethane	3.2E+02	µg/L	4.1E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	3.5E-01	µg/L	4.5E-06	mg/kg/day	3.1E-02	1/(mg/kg/day)	1.4E-07	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	1.8E+03	µg/L	2.4E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	3.9E+01	µg/L	4.9E-04	mg/kg/day	1.1E-02	1/(mg/kg/day)	5.4E-06	NA	NA	NA	NA	NA
				Methyl ethyl ketone	5.1E+03	µg/L	6.5E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Methyl isobutyl ketone	1.7E+03	µg/L	2.2E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	2.1E-03	mg/kg/day	2.0E-03	1/(mg/kg/day)	1.3E-05	NA	NA	NA	NA	NA
				Naphthalene	1.0E+01	µg/L	1.3E-04	mg/kg/day	1.2E-01	1/(mg/kg/day)	1.5E-05	NA	NA	NA	NA	NA
				Tetrachloroethene	5.7E+01	µg/L	7.3E-04	mg/kg/day	2.1E-03	1/(mg/kg/day)	1.5E-06	NA	NA	NA	NA	NA
				Toluene	1.0E+03	µg/L	1.3E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	2.7E+01	µg/L	3.5E-04	mg/kg/day	4.6E-02	1/(mg/kg/day)	2.3E-05	NA	NA	NA	NA	NA
				Vinyl chloride	5.1E+02	µg/L	6.5E-03	mg/kg/day	1.5E+00	1/(mg/kg/day)	6.4E-03	NA	NA	NA	NA	NA
				Xylene, m,p-	1.6E+02	µg/L	2.1E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Xylene, o-	5.8E+01	µg/L	7.4E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								8.0E-03					NA

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	6.4E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	2.4E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	5.1E+00	µg/L	5.3E-07	mg/kg/day	8.0E-02	1/(mg/kg/day)	4.2E-08	NA	NA	NA	NA	NA
				Arsenic	5.6E+01	µg/L	3.7E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	5.6E-06	NA	NA	NA	NA	NA
				Barium	2.0E+03	µg/L	1.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1,1-Trichloroethane	1.6E+03	µg/L	3.5E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1,2-Trichloroethane	1.2E+00	µg/L	1.0E-06	mg/kg/day	5.7E-02	1/(mg/kg/day)	5.8E-08	NA	NA	NA	NA	NA
				1,1-Dichloroethane	4.9E+03	µg/L	4.6E-03	mg/kg/day	5.7E-03	1/(mg/kg/day)	2.6E-05	NA	NA	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	1.6E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	4.6E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,2-Dichloroethane	2.3E+01	µg/L	1.3E-05	mg/kg/day	9.1E-02	1/(mg/kg/day)	1.2E-06	NA	NA	NA	NA	NA
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	9.9E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Acetone	6.7E+03	µg/L	3.8E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	3.5E+01	µg/L	6.5E-05	mg/kg/day	5.5E-02	1/(mg/kg/day)	3.6E-06	NA	NA	NA	NA	NA
				Chloroethane	3.2E+02	µg/L	2.2E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	3.5E-01	µg/L	3.8E-07	mg/kg/day	3.1E-02	1/(mg/kg/day)	1.2E-08	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	1.8E+03	µg/L	2.8E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	3.9E+01	µg/L	2.8E-04	mg/kg/day	1.1E-02	1/(mg/kg/day)	3.1E-06	NA	NA	NA	NA	NA
				Methyl ethyl ketone	5.1E+03	µg/L	5.9E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Methyl isobutyl ketone	1.7E+03	µg/L	7.6E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	7.2E-05	mg/kg/day	2.0E-03	1/(mg/kg/day)	4.4E-07	NA	NA	NA	NA	NA
				Naphthalene	1.0E+01	µg/L	7.9E-05	mg/kg/day	1.2E-01	1/(mg/kg/day)	9.4E-06	NA	NA	NA	NA	NA
				Tetrachloroethene	5.7E+01	µg/L	4.1E-04	mg/kg/day	2.1E-03	1/(mg/kg/day)	8.5E-07	NA	NA	NA	NA	NA
				Toluene	1.0E+03	µg/L	4.3E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	2.7E+01	µg/L	5.4E-05	mg/kg/day	4.6E-02	1/(mg/kg/day)	1.7E-04	NA	NA	NA	NA	NA
				Vinyl chloride	5.1E+02	µg/L	4.8E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	4.6E-04	NA	NA	NA	NA	NA
				Xylene, m,p-	1.6E+02	µg/L	1.2E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Xylene, o-	5.8E+01	µg/L	4.2E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								6.9E-04					NA
		Exposure Point Total									8.7E-03					NA
	Exposure Medium Total										8.7E-03					NA

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater	Household Air	Vapors in House	Inhalation	1,1,1-Trichloroethane	1.6E+03	µg/L	2.8E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
(cont.)	(Domestic Use)	(Domestic Use)		1,1,2-Trichloroethane	1.2E+00	µg/L	2.1E-04	mg/m^3	1.6E-05	1/(µg/m3)	3.3E-06	NA	NA	NA	NA	NA
				1,1-Dichloroethane	3.4E+03	µg/L	6.0E-01	mg/m^3	1.6E-06	1/(µg/m3)	9.6E-04	NA	NA	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	1.8E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	6.0E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,2-Dichloroethane	2.3E+01	µg/L	4.1E-03	mg/m^3	2.6E-05	1/(µg/m3)	1.1E-04	NA	NA	NA	NA	NA
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	1.8E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Acetone	6.7E+03	µg/L	1.2E+00	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	3.5E+01	µg/L	6.3E-03	mg/m^3	7.8E-06	1/(µg/m3)	4.9E-05	NA	NA	NA	NA	NA
				Chloroethane	3.2E+02	µg/L	5.7E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	3.5E-01	µg/L	6.2E-05	mg/m^3	2.3E-05	1/(µg/m3)	1.4E-06	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	1.8E+03	µg/L	3.3E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	3.9E+01	µg/L	6.9E-03	mg/m^3	2.5E-06	1/(µg/m3)	1.7E-05	NA	NA	NA	NA	NA
				Methyl ethyl ketone	5.1E+03	µg/L	9.1E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Methyl isobutyl ketone	1.7E+03	µg/L	3.0E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	2.8E-02	mg/m^3	1.0E-08	1/(µg/m3)	7.9E-07	NA	NA	NA	NA	NA
				Naphthalene	1.0E+01	µg/L	1.8E-03	mg/m^3	3.4E-05	1/(µg/m3)	6.1E-05	NA	NA	NA	NA	NA
				Tetrachloroethene	5.7E+01	µg/L	1.0E-02	mg/m^3	2.6E-07	1/(µg/m3)	2.6E-06	NA	NA	NA	NA	NA
				Toluene	1.0E+03	µg/L	1.8E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	2.7E+01	µg/L	4.8E-03	mg/m^3	4.1E-06	1/(µg/m3)	2.8E-05	NA	NA	NA	NA	NA
				Vinyl chloride	3.6E+02	µg/L	6.3E-02	mg/m^3	8.8E-06	1/(µg/m3)	4.9E-04	NA	NA	NA	NA	NA
				Xylene, m,p-	1.6E+02	µg/L	2.8E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Xylene, o-	5.8E+01	µg/L	1.0E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								1.7E-03					NA
		Exposure Point Total									1.7E-03					NA
	Exposure Medium Total										1.7E-03					NA
Groundwater Total											1.2E-02					NA
Receptor Total											1E-02					NA

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.3.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations														
					Value	Units	Intake							CSF/Unit Risk							Cancer Risk
							Value						Units	Value						Units	
							0-2 yrs	2-6 yrs	6-16 yrs	16-26 yrs	0-6 yrs	6-26 yrs		0-2 yrs (ADAF=10)	2-6 yrs (ADAF=3)	6-16 yrs (ADAF=3)	16-26 yrs (ADAF=1)	0-6 yrs (1)	6-26 yrs (2)		
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	1.9E-02	mg/m^3	5.2E-04	1.0E-03	2.6E-03	2.6E-03	NA	NA	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	NA	NA	$1/(\mu g/m^3)$	2E-05
				Vinyl Chloride	4.3E-01	mg/m^3	NA	NA	NA	NA	3.6E-02	1.2E-01	mg/m^3	NA	NA	NA	NA	8.8E-06	4.4E-06	$1/(\mu g/m^3)$	8E-04
	Groundwater	Tapwater	Ingestion	Methylene chloride	1.6E+02	ug/L	2.3E-04	4.6E-04	6.8E-04	6.8E-04	NA	NA	mg/kg-day	2.0E-02	6.0E-03	6.0E-03	2.0E-03	NA	NA	1/(mg/kg-day)	1E-05
				Trichloroethene	2.7E+01	ug/L	3.9E-05	7.7E-05	1.2E-04	1.2E-04	NA	NA	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	NA	NA	1/(mg/kg-day)	1E-05
				Vinyl chloride	5.1E+02	ug/L	NA	NA	NA	NA	2.2E-03	4.4E-03	mg/kg-day	NA	NA	NA	NA	1.5E+00	7.2E-01	1/(mg/kg-day)	6E-03
			Dermal	Methylene chloride	1.6E+02	ug/L	7.5E-06	1.5E-05	2.5E-05	2.5E-05	NA	NA	mg/kg-day	2.0E-02	6.0E-03	6.0E-03	2.0E-03	NA	NA	1/(mg/kg-day)	4E-07
				Trichloroethene	2.7E+01	ug/L	5.6E-06	1.1E-05	1.9E-05	1.9E-05	NA	NA	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	NA	NA	1/(mg/kg-day)	2E-06
				Vinyl chloride	5.1E+02	ug/L	NA	NA	NA	NA	1.5E-04	3.4E-04	mg/kg-day	NA	NA	NA	NA	1.5E+00	7.2E-01	1/(mg/kg-day)	5E-04
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Methylene chloride	1.6E+02	ug/L	2.2E-03	4.4E-03	1.1E-02	1.1E-02	NA	NA	mg/m^3	1.0E-07	3.0E-08	3.0E-08	1.0E-08	NA	NA	$1/(\mu g/m^3)$	8E-07
				Trichloroethene	2.7E+01	ug/L	3.7E-04	7.4E-04	1.9E-03	1.9E-03	NA	NA	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	NA	NA	$1/(\mu g/m^3)$	1E-05
				Vinyl chloride	5.1E+02	ug/L	NA	NA	NA	NA	2.1E-02	7.0E-02	mg/m^3	NA	NA	NA	NA	8.8E-06	4.4E-06	$1/(\mu g/m^3)$	5E-04

Notes:
(1) Continuous lifetime exposure to vinyl chloride from birth.
(2) Continuous lifetime exposure to vinyl chloride during adulthood.
ADAF = Age-dependent adjustment factor
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
$\mu g/m^3$= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.3.RME SUPPLEMENT B

CALCULATION OF CHEMICAL CANCER RISKS FOR TRICHLOROETHENE

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	(1)
Groundwater	Indoor Air	Indoor Air	Inhalation	Trichloroethene (Kidney)	1.9E-02	mg/m^3	(2)	mg/m^3	1.0E-06	1/(µg/m3)	2E-05
				Trichloroethene (NHL + Liver)	1.9E-02	mg/m^3	6.8E-03	mg/m^3	3.1E-06	1/(µg/m3)	2E-05
			Exp. Route Total								4E-05
	Tapwater	Tapwater	Ingestion	Trichloroethene (Kidney)	2.7E+01	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	1E-05
				Trichloroethene (NHL + Liver)	2.7E+01	µg/L	3.5E-04	mg/kg/day	3.7E-02	1/(mg/kg/day)	1E-05
			Exp. Route Total								2E-05
			Dermal	Trichloroethene (Kidney)	2.7E+01	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	2E-06
				Trichloroethene (NHL + Liver)	2.7E+01	µg/L	4.6E-03	mg/kg/day	3.7E-02	1/(mg/kg/day)	2E-04
			Exp. Route Total								2E-04
	Household Air	Household Air	Inhalation	Trichloroethene (Kidney)	2.7E+01	µg/L	(2)	mg/m^3	1.0E-06	1/(µg/m3)	1E-05
				Trichloroethene (NHL + Liver)	2.7E+01	µg/L	4.8E-03	mg/m^3	3.1E-06	1/(µg/m3)	1E-05
			Exp. Route Total								3E-05

Notes:

(1) Carcinogenic risks were estimated for trichloroethene by summing the risks for two different approaches: 1) Using the oral CSF factor for kidney cancer, which has a mutagenic mode of action (calculated in Table 7.3 RME Supplement A), and 2) using the CSF for non-Hodgkin lymphoma (NHL) and liver cancer.

(2) Intakes and exposure concentrations using the toxicity values for the kidney component of TCE were estimated on Table 7.3 RME Supplement A.

CSF = Cancer slope factor

µg/L = microgram per liter

mg/m^3= milligram per cubic meter

mg/kg/day = milligram per kilogram per day

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater	Indoor Air	Indoor Air	Inhalation	1,1,1-Trichloroethane	8.4E+02	μg/m3	6.8E-02	mg/m3	NA	NA	NA	1.9E-01	mg/m3	5.0E+00	mg/m3	3.8E-02
	(Vapor Intrusion)	(Vapor Intrusion)		1,1,2-Trichloroethane	4.5E-02	μg/m3	3.6E-06	mg/m3	1.6E-05	1/(ug/m3)	5.8E-08	1.0E-05	mg/m3	2.0E-04	mg/m3	5.1E-02
				1,1-Dichloroethane	6.9E+02	μg/m3	5.7E-02	mg/m3	1.6E-06	1/(ug/m3)	9.1E-05	1.6E-01	mg/m3	NA	NA	NA
				1,1-Dichloroethene	1.9E+02	μg/m3	1.5E-02	mg/m3	NA	NA	NA	4.3E-02	mg/m3	2.0E-01	mg/m3	2.2E-01
				1,2,4-Trimethylbenzene	1.3E+01	μg/m3	1.0E-03	mg/m3	NA	NA	NA	2.9E-03	mg/m3	6.0E-02	mg/m3	4.8E-02
				1,2-Dichloroethane	2.2E+00	μg/m3	1.8E-04	mg/m3	2.6E-05	1/(ug/m3)	4.7E-06	5.1E-04	mg/m3	7.0E-03	mg/m3	7.3E-02
				Benzene	1.2E+01	μg/m3	9.5E-04	mg/m3	7.8E-06	1/(ug/m3)	7.4E-06	2.7E-03	mg/m3	3.0E-02	mg/m3	8.9E-02
				cis-1,2-Dichloroethene	2.0E+02	μg/m3	1.6E-02	mg/m3	NA	NA	NA	4.6E-02	mg/m3	4.0E-02	mg/m3	1.1E+00
				Ethylbenzene	2.1E+01	μg/m3	1.7E-03	mg/m3	2.5E-06	1/(ug/m3)	4.3E-06	4.9E-03	mg/m3	1.0E+00	mg/m3	4.9E-03
				Tetrachloroethene	2.3E+01	μg/m3	1.9E-03	mg/m3	2.6E-07	1/(ug/m3)	4.8E-07	5.2E-03	mg/m3	4.0E-02	mg/m3	1.3E-01
				Trichloroethene	1.9E+01	μg/m3	1.6E-03	mg/m3	4.1E-06	1/(ug/m3)	6.4E-06	4.4E-03	mg/m3	2.0E-03	mg/m3	2.2E+00
				Vinyl chloride	4.3E+02	μg/m3	3.5E-02	mg/m3	8.8E-06	1/(ug/m3)	3.1E-04	9.9E-02	mg/m3	1.0E-01	mg/m3	9.9E-01
				Xylene, m,p-	8.5E+01	μg/m3	6.9E-03	mg/m3	NA	NA	NA	1.9E-02	mg/m3	1.0E-01	mg/m3	1.9E-01
				Xylene, o-	2.2E+01	μg/m3	NA	NA	NA	NA	NA	2.1E-02	mg/m3	1.0E-01	mg/m3	2.1E-01
			Exp. Route Total								4.2E-04					5.4E+00
		Exposure Point Total									4.2E-04					5.4E+00
	Exposure Medium Total										4.2E-04					5.4E+00

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	3.7E-06	mg/kg/day	NA	NA	NA	1.0E-05	mg/kg/day	1.0E-04	mg/kg/day	1.0E-01
(cont.)				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	1.3E-05	mg/kg/day	NA	NA	NA	3.8E-05	mg/kg/day	1.0E-04	mg/kg/day	3.8E-01
				RDX	5.1E+00	µg/L	1.6E-05	mg/kg/day	8.0E-02	1/(mg/kg/day)	1.2E-06	4.4E-05	mg/kg/day	4.0E-03	mg/kg/day	1.1E-02
				Arsenic	5.6E+01	µg/L	1.7E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.6E-04	4.8E-04	mg/kg/day	3.0E-04	mg/kg/day	1.6E+00
				Barium	2.0E+03	µg/L	6.1E-03	mg/kg/day	NA	NA	NA	1.7E-02	mg/kg/day	2.0E-01	mg/kg/day	8.6E-02
				1,1,1-Trichloroethane	1.6E+03	µg/L	4.9E-03	mg/kg/day	NA	NA	NA	1.4E-02	mg/kg/day	2.0E+00	mg/kg/day	6.8E-03
				1,1,2-Trichloroethane	1.2E+00	µg/L	3.6E-06	mg/kg/day	5.7E-02	1/(mg/kg/day)	2.0E-07	9.9E-06	mg/kg/day	4.0E-03	mg/kg/day	2.5E-03
				1,1-Dichloroethane	4.9E+03	µg/L	1.5E-02	mg/kg/day	5.7E-03	1/(mg/kg/day)	8.5E-05	4.2E-02	mg/kg/day	2.0E-01	mg/kg/day	2.1E-01
				1,1-Dichloroethene	1.0E+02	µg/L	3.1E-04	mg/kg/day	NA	NA	NA	8.6E-04	mg/kg/day	5.0E-02	mg/kg/day	1.7E-02
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	1.0E-04	mg/kg/day	NA	NA	NA	2.9E-04	mg/kg/day	1.0E-02	mg/kg/day	2.9E-02
				1,2-Dichloroethane	2.3E+01	µg/L	7.0E-05	mg/kg/day	9.1E-02	1/(mg/kg/day)	6.3E-06	1.9E-04	mg/kg/day	6.0E-03	mg/kg/day	3.2E-02
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	3.0E-05	mg/kg/day	NA	NA	NA	8.5E-05	mg/kg/day	1.0E-02	mg/kg/day	8.5E-03
				Acetone	6.7E+03	µg/L	2.0E-02	mg/kg/day	NA	NA	NA	5.7E-02	mg/kg/day	9.0E-01	mg/kg/day	6.4E-02
				Benzene	3.5E+01	µg/L	1.1E-04	mg/kg/day	5.5E-02	1/(mg/kg/day)	5.9E-06	3.0E-04	mg/kg/day	4.0E-03	mg/kg/day	7.5E-02
				Chloroethane	3.2E+02	µg/L	9.8E-04	mg/kg/day	NA	NA	NA	2.8E-03	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	1.1E-06	mg/kg/day	3.1E-02	1/(mg/kg/day)	3.3E-08	3.0E-06	mg/kg/day	1.0E-02	mg/kg/day	3.0E-04
				cis-1,2-Dichloroethene	1.8E+03	µg/L	5.6E-03	mg/kg/day	NA	NA	NA	1.6E-02	mg/kg/day	2.0E-03	mg/kg/day	7.8E+00
				Ethylbenzene	3.9E+01	µg/L	1.2E-04	mg/kg/day	1.1E-02	1/(mg/kg/day)	1.3E-06	3.3E-04	mg/kg/day	1.0E-01	mg/kg/day	3.3E-03
				Methyl ethyl ketone	5.1E+03	µg/L	1.6E-02	mg/kg/day	NA	NA	NA	4.4E-02	mg/kg/day	6.0E-01	mg/kg/day	7.3E-02
				Methyl isobutyl ketone	1.7E+03	µg/L	5.2E-03	mg/kg/day	NA	NA	NA	1.5E-02	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	4.9E-04	mg/kg/day	2.0E-03	1/(mg/kg/day)	9.8E-07	1.4E-03	mg/kg/day	6.0E-03	mg/kg/day	2.3E-01
				Naphthalene	1.0E+01	µg/L	3.1E-05	mg/kg/day	1.2E-01	1/(mg/kg/day)	3.7E-06	8.6E-05	mg/kg/day	2.0E-02	mg/kg/day	4.3E-03
				Tetrachloroethene	5.7E+01	µg/L	1.7E-04	mg/kg/day	2.1E-03	1/(mg/kg/day)	3.6E-07	4.9E-04	mg/kg/day	6.0E-03	mg/kg/day	8.1E-02
				Toluene	1.0E+03	µg/L	3.1E-03	mg/kg/day	NA	NA	NA	8.8E-03	mg/kg/day	8.0E-02	mg/kg/day	1.1E-01
				Trichloroethene	2.7E+01	µg/L	8.3E-05	mg/kg/day	4.6E-02	1/(mg/kg/day)	3.8E-06	2.3E-04	mg/kg/day	5.0E-04	mg/kg/day	4.6E-01
				Vinyl chloride	5.1E+02	µg/L	1.6E-03	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.3E-03	4.4E-03	mg/kg/day	3.0E-03	mg/kg/day	1.5E+00
				Xylene, m,p-	1.6E+02	µg/L	4.9E-04	mg/kg/day	NA	NA	NA	1.4E-03	mg/kg/day	2.0E-01	mg/kg/day	6.8E-03
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	2.0E-01	mg/kg/day	8.6E-03
			Exp. Route Total								2.7E-03					1.3E+01

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	2.7E-08	mg/kg/day	NA	NA	NA	7.5E-08	mg/kg/day	1.0E-04	mg/kg/day	7.5E-04
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	9.8E-08	mg/kg/day	NA	NA	NA	2.7E-07	mg/kg/day	1.0E-04	mg/kg/day	2.7E-03
				RDX	5.1E+00	µg/L	2.2E-08	mg/kg/day	8.0E-02	1/(mg/kg/day)	1.8E-09	6.2E-08	mg/kg/day	4.0E-03	mg/kg/day	1.5E-05
				Arsenic	5.6E+01	µg/L	8.6E-08	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.3E-07	2.4E-07	mg/kg/day	3.0E-04	mg/kg/day	8.0E-04
				Barium	2.0E+03	µg/L	3.1E-06	mg/kg/day	NA	NA	NA	8.6E-06	mg/kg/day	1.4E-02	mg/kg/day	6.1E-04
				1,1,1-Trichloroethane	1.6E+03	µg/L	1.5E-04	mg/kg/day	NA	NA	NA	4.1E-04	mg/kg/day	2.0E+00	mg/kg/day	2.0E-04
				1,1,2-Trichloroethane	1.2E+00	µg/L	4.2E-08	mg/kg/day	5.7E-02	1/(mg/kg/day)	2.4E-09	1.2E-07	mg/kg/day	4.0E-03	mg/kg/day	3.0E-05
				1,1-Dichloroethane	4.9E+03	µg/L	1.9E-04	mg/kg/day	5.7E-03	1/(mg/kg/day)	1.1E-06	5.4E-04	mg/kg/day	2.0E-01	mg/kg/day	2.7E-03
				1,1-Dichloroethene	1.0E+02	µg/L	6.7E-06	mg/kg/day	NA	NA	NA	1.9E-05	mg/kg/day	5.0E-02	mg/kg/day	3.7E-04
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	1.9E-05	mg/kg/day	NA	NA	NA	5.3E-05	mg/kg/day	1.0E-02	mg/kg/day	5.3E-03
				1,2-Dichloroethane	2.3E+01	µg/L	5.5E-07	mg/kg/day	9.1E-02	1/(mg/kg/day)	5.0E-08	1.6E-06	mg/kg/day	6.0E-03	mg/kg/day	2.6E-04
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	4.1E-06	mg/kg/day	NA	NA	NA	1.2E-05	mg/kg/day	1.0E-02	mg/kg/day	1.2E-03
				Acetone	6.7E+03	µg/L	1.5E-05	mg/kg/day	NA	NA	NA	4.3E-05	mg/kg/day	9.0E-01	mg/kg/day	4.8E-05
				Benzene	3.5E+01	µg/L	2.7E-06	mg/kg/day	5.5E-02	1/(mg/kg/day)	1.5E-07	7.4E-06	mg/kg/day	4.0E-03	mg/kg/day	1.9E-03
				Chloroethane	3.2E+02	µg/L	9.1E-06	mg/kg/day	NA	NA	NA	2.5E-05	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	1.6E-08	mg/kg/day	3.1E-02	1/(mg/kg/day)	4.9E-10	4.4E-08	mg/kg/day	1.0E-02	mg/kg/day	4.4E-06
				cis-1,2-Dichloroethene	1.8E+03	µg/L	1.2E-04	mg/kg/day	NA	NA	NA	3.2E-04	mg/kg/day	2.0E-03	mg/kg/day	1.6E-01
				Ethylbenzene	3.9E+01	µg/L	1.2E-05	mg/kg/day	1.1E-02	1/(mg/kg/day)	1.3E-07	3.2E-05	mg/kg/day	1.0E-01	mg/kg/day	3.2E-04
				Methyl ethyl ketone	5.1E+03	µg/L	2.4E-05	mg/kg/day	NA	NA	NA	6.7E-05	mg/kg/day	6.0E-01	mg/kg/day	1.1E-04
				Methyl isobutyl ketone	1.7E+03	µg/L	3.2E-05	mg/kg/day	NA	NA	NA	8.9E-05	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	3.0E-06	mg/kg/day	2.0E-03	1/(mg/kg/day)	6.0E-09	8.4E-06	mg/kg/day	6.0E-03	mg/kg/day	1.4E-03
				Naphthalene	1.0E+01	µg/L	3.3E-06	mg/kg/day	1.2E-01	1/(mg/kg/day)	3.9E-07	9.1E-06	mg/kg/day	2.0E-02	mg/kg/day	4.6E-04
				Tetrachloroethene	5.7E+01	µg/L	1.7E-05	mg/kg/day	2.1E-03	1/(mg/kg/day)	3.5E-08	4.7E-05	mg/kg/day	6.0E-03	mg/kg/day	7.9E-03
				Toluene	1.0E+03	µg/L	1.8E-04	mg/kg/day	NA	NA	NA	5.0E-04	mg/kg/day	8.0E-02	mg/kg/day	6.2E-03
				Trichloroethene	2.7E+01	µg/L	2.2E-06	mg/kg/day	4.6E-02	1/(mg/kg/day)	1.0E-07	6.3E-06	mg/kg/day	5.0E-04	mg/kg/day	1.3E-02
				Vinyl chloride	5.1E+02	µg/L	2.0E-05	mg/kg/day	1.5E+00	1/(mg/kg/day)	2.9E-05	5.5E-05	mg/kg/day	3.0E-03	mg/kg/day	1.8E-02
				Xylene, m,p-	1.6E+02	µg/L	4.9E-05	mg/kg/day	NA	NA	NA	1.4E-04	mg/kg/day	2.0E-01	mg/kg/day	6.8E-04
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	5.4E-04	mg/kg/day	2.0E-01	mg/kg/day	2.7E-03
			Exp. Route Total								3.1E-05					2.3E-01
		Exposure Point Total									2.7E-03					1.3E+01
	Exposure Medium Total										2.7E-03					1.3E+01
Groundwater Total											3.2E-03					1.8E+01
Receptor Total											3E-03					2E+01

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.4.RME SUPPLEMENT

CALCULATION OF DAEVENT

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
2-Amino-4,6-dinitrotoluene	1.2E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.20	3.5E-09	2
4-Amino-2,6-dinitrotoluene	4.4E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.20	1.3E-08	2
RDX	5.1E+00	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.20	2.9E-09	2
Arsenic	5.6E+01	1.0E-03	NA	NA	NA	NA	0.20	1.1E-08	1
Barium	2.0E+03	1.0E-03	NA	NA	NA	NA	0.20	4.0E-07	1
1,1,1-Trichloroethane	1.6E+03	1.3E-02	5.6E-02	5.9E-01	1.4E+00	1.0E+00	0.20	1.9E-05	2
1,1,2-Trichloroethane	1.2E+00	5.0E-03	2.2E-02	5.9E-01	1.4E+00	1.0E+00	0.20	5.5E-09	2
1,1-Dichloroethane	4.9E+03	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.20	2.5E-05	2
1,1-Dichloroethene	1.0E+02	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.20	8.8E-07	2
1,2,4-Trimethylbenzene	3.3E+01	8.6E-02	3.6E-01	5.0E-01	1.2E+00	1.0E+00	0.20	2.5E-06	2
1,2-Dichloroethane	2.3E+01	4.2E-03	1.6E-02	3.8E-01	9.0E-01	1.0E+00	0.20	7.3E-08	2
1,3,5-Trimethylbenzene	1.0E+01	6.2E-02	2.6E-01	5.0E-01	1.2E+00	1.0E+00	0.20	5.4E-07	2
Acetone	6.7E+03	5.1E-04	1.5E-03	2.2E-01	5.3E-01	1.0E+00	0.20	2.0E-06	2
Benzene	3.5E+01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.20	3.5E-07	2
Chloroethane	3.2E+02	6.1E-03	1.9E-02	2.4E-01	5.8E-01	1.0E+00	0.20	1.2E-06	2
Chloroform	3.5E-01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.20	2.1E-09	2
cis-1,2-Dichloroethene	1.8E+03	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.20	1.5E-05	2
Ethylbenzene	3.9E+01	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.20	1.5E-06	2
Methyl ethyl ketone	5.1E+03	9.6E-04	3.1E-03	2.7E-01	6.4E-01	1.0E+00	0.20	3.1E-06	2
Methyl isobutyl ketone	1.7E+03	3.2E-03	1.2E-02	3.8E-01	9.2E-01	1.0E+00	0.20	4.1E-06	2
Methylene chloride	1.6E+02	3.5E-03	1.3E-02	3.1E-01	7.5E-01	1.0E+00	0.20	3.9E-07	2
Naphthalene	1.0E+01	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.20	4.3E-07	2
Tetrachloroethene	5.7E+01	3.3E-02	1.7E-01	8.9E-01	2.1E+00	1.0E+00	0.20	2.2E-06	2
Toluene	1.0E+03	3.1E-02	1.1E-01	3.5E-01	8.3E-01	1.0E+00	0.20	2.3E-05	2
Trichloroethene	2.7E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.20	2.9E-07	2
Vinyl chloride	5.1E+02	8.4E-03	2.5E-02	2.4E-01	5.7E-01	1.0E+00	0.20	2.6E-06	2
Xylene, m,p-	1.6E+02	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.20	6.4E-06	2
Xylene, o-	5.8E+01	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.20	2.3E-06	2

TABLE 7.4.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	5.4E-11	mg/kg-day	NA	NA	NA	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	3.9E-04
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	2.0E-10	mg/kg-day	NA	NA	NA	4.2E-07	mg/kg/day	3.0E-04	mg/kg/day	1.4E-03
				RDX	5.1E+00	µg/L	2.3E-10	mg/kg-day	8.0E-02	1/(mg/kg/day)	1.8E-11	4.9E-07	mg/kg/day	1.0E-01	mg/kg/day	4.9E-06
				Arsenic	5.6E+01	µg/L	2.5E-09	mg/kg-day	1.5E+00	1/(mg/kg/day)	3.8E-09	5.4E-06	mg/kg/day	3.0E-04	mg/kg/day	1.8E-02
				Barium	2.0E+03	µg/L	9.0E-08	mg/kg-day	NA	NA	NA	1.9E-04	mg/kg/day	2.0E-01	mg/kg/day	9.6E-04
				Naphthalene	1.0E+01	µg/L	4.5E-10	mg/kg-day	1.2E-01	1/(mg/kg/day)	5.4E-11	9.6E-07	mg/kg/day	6.0E-01	mg/kg/day	1.6E-06
				1,1,1-Trichloroethane	2.0E+03	µg/L	9.0E-08	mg/kg-day	NA	NA	NA	1.9E-04	mg/kg/day	7.0E+00	mg/kg/day	2.8E-05
				1,1,2-Trichloroethane	6.4E-01	µg/L	2.9E-11	mg/kg-day	5.7E-02	1/(mg/kg/day)	1.6E-12	6.2E-08	mg/kg/day	4.0E-03	mg/kg/day	1.5E-05
				1,1-Dichloroethane	4.9E+03	µg/L	2.2E-07	mg/kg-day	5.7E-03	1/(mg/kg/day)	1.3E-09	4.7E-04	mg/kg/day	2.0E+00	mg/kg/day	2.4E-04
				1,1-Dichloroethene	1.1E+02	µg/L	4.8E-09	mg/kg-day	NA	NA	NA	1.0E-05	mg/kg/day	9.0E-03	mg/kg/day	1.1E-03
				1,2,4-Trimethylbenzene	6.3E+01	µg/L	2.8E-09	mg/kg-day	NA	NA	NA	6.1E-06	mg/kg/day	4.0E-02	mg/kg/day	1.5E-04
				1,2-Dichloroethane	3.3E+01	µg/L	1.5E-09	mg/kg-day	9.1E-02	1/(mg/kg/day)	1.4E-10	3.2E-06	mg/kg/day	2.0E-02	mg/kg/day	1.6E-04
				1,3,5-Trimethylbenzene	1.6E+01	µg/L	7.2E-10	mg/kg-day	NA	NA	NA	1.5E-06	mg/kg/day	4.0E-02	mg/kg/day	3.9E-05
				Acetone	6.7E+03	µg/L	3.0E-07	mg/kg-day	NA	NA	NA	6.4E-04	mg/kg/day	6.0E-01	mg/kg/day	1.1E-03
				Benzene	8.2E+01	µg/L	3.7E-09	mg/kg-day	5.5E-02	1/(mg/kg/day)	2.0E-10	7.9E-06	mg/kg/day	1.0E-02	mg/kg/day	7.9E-04
				Chloroethane	6.9E+02	µg/L	3.1E-08	mg/kg-day	NA	NA	NA	6.6E-05	mg/kg/day	1.0E-01	mg/kg/day	6.6E-04
				Chloroform	3.5E-01	µg/L	1.6E-11	mg/kg-day	3.1E-02	1/(mg/kg/day)	4.9E-13	3.4E-08	mg/kg/day	1.0E-01	mg/kg/day	3.4E-07
				cis-1,2-Dichloroethene	2.0E+03	µg/L	9.0E-08	mg/kg-day	NA	NA	NA	1.9E-04	mg/kg/day	2.0E-02	mg/kg/day	9.6E-03
				Ethylbenzene	6.6E+01	µg/L	3.0E-09	mg/kg-day	1.1E-02	1/(mg/kg/day)	3.3E-11	6.4E-06	mg/kg/day	5.0E-02	mg/kg/day	1.3E-04
				Methyl ethyl ketone	5.1E+03	µg/L	2.3E-07	mg/kg-day	NA	NA	NA	4.9E-04	mg/kg/day	2.0E+00	mg/kg/day	2.5E-04
				Methyl isobutyl ketone	1.7E+03	µg/L	7.7E-08	mg/kg-day	NA	NA	NA	1.6E-04	mg/kg/day	8.0E-01	mg/kg/day	2.0E-04
				Methylene chloride	1.6E+02	µg/L	7.2E-09	mg/kg-day	2.0E-03	1/(mg/kg/day)	1.4E-11	1.5E-05	mg/kg/day	6.0E-02	mg/kg/day	2.6E-04
				Tetrachloroethene	2.3E+01	µg/L	1.0E-09	mg/kg-day	2.1E-03	1/(mg/kg/day)	2.2E-12	2.2E-06	mg/kg/day	8.0E-03	mg/kg/day	2.8E-04
				Toluene	1.9E+03	µg/L	8.6E-08	mg/kg-day	NA	NA	NA	1.8E-04	mg/kg/day	8.0E-01	mg/kg/day	2.3E-04
				Trichloroethene	8.2E+01	µg/L	3.7E-09	mg/kg-day	4.6E-02	1/(mg/kg/day)	1.7E-10	7.9E-06	mg/kg/day	5.0E-04	mg/kg/day	1.6E-02
				Vinyl chloride	1.8E+02	µg/L	8.0E-09	mg/kg-day	1.5E+00	1/(mg/kg/day)	1.2E-08	1.7E-05	mg/kg/day	3.0E-03	mg/kg/day	5.7E-03
				Xylene, m,p-	2.7E+02	µg/L	1.2E-08	mg/kg-day	NA	NA	NA	2.6E-05	mg/kg/day	4.0E-01	mg/kg/day	6.5E-05
				Xylene, o-	8.9E+01	µg/L	4.0E-09	mg/kg-day	NA	NA	NA	8.6E-06	mg/kg/day	4.0E-01	mg/kg/day	2.1E-05
			Exp. Route Total								1.8E-08					5.8E-02

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Shallow Groundwater	Shallow Groundwater	Shallow Groundwater in Trench	Dermal	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	2.4E-10	mg/kg-day	NA	NA	NA	5.1E-07	mg/kg-day	3.0E-04	mg/kg/day	1.7E-03
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	8.8E-10	mg/kg-day	NA	NA	NA	1.9E-06	mg/kg-day	3.0E-04	mg/kg/day	6.2E-03
				RDX	5.1E+00	µg/L	2.0E-10	mg/kg-day	8.0E-02	1/(mg/kg/day)	1.6E-11	4.2E-07	mg/kg-day	1.0E-01	mg/kg/day	4.2E-06
				Arsenic	5.6E+01	µg/L	1.7E-09	mg/kg-day	1.5E+00	1/(mg/kg/day)	2.6E-09	3.6E-06	mg/kg-day	3.0E-04	mg/kg/day	1.2E-02
				Barium	2.0E+03	µg/L	6.1E-08	mg/kg-day	NA	NA	NA	1.3E-04	mg/kg-day	1.4E-02	mg/kg/day	9.3E-03
				Naphthalene	1.0E+01	µg/L	2.9E-08	mg/kg-day	1.2E-01	1/(mg/kg/day)	3.5E-09	6.2E-05	mg/kg-day	6.0E-01	mg/kg/day	1.0E-04
				1,1,1-Trichloroethane	2.0E+03	µg/L	1.6E-06	mg/kg-day	NA	NA	NA	3.5E-03	mg/kg-day	7.0E+00	mg/kg/day	5.0E-04
				1,1,2-Trichloroethane	6.4E-01	µg/L	2.1E-10	mg/kg-day	5.7E-02	1/(mg/kg/day)	1.2E-11	4.4E-07	mg/kg-day	4.0E-03	mg/kg/day	1.1E-04
				1,1-Dichloroethane	4.9E+03	µg/L	1.8E-06	mg/kg-day	5.7E-03	1/(mg/kg/day)	1.0E-08	3.8E-03	mg/kg-day	2.0E+00	mg/kg/day	1.9E-03
				1,1-Dichloroethene	1.1E+02	µg/L	6.5E-08	mg/kg-day	NA	NA	NA	1.4E-04	mg/kg-day	9.0E-03	mg/kg/day	1.5E-02
				1,2,4-Trimethylbenzene	6.3E+01	µg/L	3.2E-07	mg/kg-day	NA	NA	NA	6.8E-04	mg/kg-day	4.0E-02	mg/kg/day	1.7E-02
				1,2-Dichloroethane	3.3E+01	µg/L	7.4E-09	mg/kg-day	9.1E-02	1/(mg/kg/day)	6.7E-10	1.6E-05	mg/kg-day	2.0E-02	mg/kg/day	7.9E-04
				1,3,5-Trimethylbenzene	1.6E+01	µg/L	5.9E-08	mg/kg-day	NA	NA	NA	1.3E-04	mg/kg-day	4.0E-02	mg/kg/day	3.1E-03
				Acetone	6.7E+03	µg/L	1.5E-07	mg/kg-day	NA	NA	NA	3.2E-04	mg/kg-day	6.0E-01	mg/kg/day	5.4E-04
				Benzene	8.2E+01	µg/L	5.8E-08	mg/kg-day	5.5E-02	1/(mg/kg/day)	3.2E-09	1.2E-04	mg/kg-day	1.0E-02	mg/kg/day	1.2E-02
				Chloroethane	6.9E+02	µg/L	1.9E-07	mg/kg-day	NA	NA	NA	4.0E-04	mg/kg-day	1.0E-02	mg/kg/day	4.0E-02
				Chloroform	3.5E-01	µg/L	1.4E-10	mg/kg-day	3.1E-02	1/(mg/kg/day)	4.4E-12	3.0E-07	mg/kg-day	1.0E-01	mg/kg/day	3.0E-06
				cis-1,2-Dichloroethene	2.0E+03	µg/L	1.2E-06	mg/kg-day	NA	NA	NA	2.5E-03	mg/kg-day	2.0E-02	mg/kg/day	1.2E-01
				Ethylbenzene	6.6E+01	µg/L	1.8E-07	mg/kg-day	1.1E-02	1/(mg/kg/day)	2.0E-09	3.9E-04	mg/kg-day	5.0E-02	mg/kg/day	7.7E-03
				Methyl ethyl ketone	5.1E+03	µg/L	2.3E-07	mg/kg-day	NA	NA	NA	4.9E-04	mg/kg-day	2.0E+00	mg/kg/day	2.4E-04
				Methyl isobutyl ketone	1.7E+03	µg/L	2.9E-07	mg/kg-day	NA	NA	NA	6.2E-04	mg/kg-day	8.0E-01	mg/kg/day	7.8E-04
				Methylene chloride	1.6E+02	µg/L	2.8E-08	mg/kg-day	2.0E-03	1/(mg/kg/day)	5.6E-11	6.0E-05	mg/kg-day	6.0E-02	mg/kg/day	1.0E-03
				Tetrachloroethene	2.3E+01	µg/L	6.2E-08	mg/kg-day	2.1E-03	1/(mg/kg/day)	1.3E-10	1.3E-04	mg/kg-day	8.0E-03	mg/kg/day	1.6E-02
				Toluene	1.9E+03	µg/L	3.0E-06	mg/kg-day	NA	NA	NA	6.4E-03	mg/kg-day	8.0E-01	mg/kg/day	8.0E-03
				Trichloroethene	8.2E+01	µg/L	6.1E-08	mg/kg-day	4.6E-02	1/(mg/kg/day)	2.8E-09	1.3E-04	mg/kg-day	5.0E-04	mg/kg/day	2.6E-01
				Vinyl chloride	1.8E+02	µg/L	6.6E-08	mg/kg-day	1.5E+00	1/(mg/kg/day)	9.9E-08	1.4E-04	mg/kg-day	3.0E-03	mg/kg/day	4.7E-02
				Xylene, m,p-	2.7E+02	µg/L	7.5E-07	mg/kg-day	NA	NA	NA	1.6E-03	mg/kg-day	4.0E-01	mg/kg/day	4.0E-03
				Xylene, o-	8.9E+01	µg/L	2.5E-07	mg/kg-day	NA	NA	NA	5.3E-04	mg/kg-day	4.0E-01	mg/kg/day	1.3E-03
			Exp. Route Total								1.2E-07					5.9E-01
		Exposure Point Total									1.4E-07					6.5E-01
	Exposure Medium Total										1.4E-07					6.5E-01

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Shallow Groundwater	Trench Air	Vapors in a Trench	Inhalation	Naphthalene	6.5E+01	$\mu g/m^3$	8.7E-07	mg/m^3	3.4E-05	1/(ug/m3)	3.0E-08	1.9E-03	mg/m^3	3.0E-03	mg/m3	6.2E-01
				1,1,1-Trichloroethane	1.4E+04	$\mu g/m^3$	1.9E-04	mg/m^3	NA	NA	NA	4.1E-01	mg/m^3	5.0E+00	mg/m3	8.1E-02
				1,1,2-Trichloroethane	4.3E+00	$\mu g/m^3$	5.8E-08	mg/m^3	1.6E-05	1/(ug/m3)	9.2E-10	1.2E-04	mg/m^3	1.1E-02	mg/m3	1.1E-02
				1,1-Dichloroethane	4.0E+04	$\mu g/m^3$	5.4E-04	mg/m^3	1.6E-06	1/(ug/m3)	8.6E-07	1.2E+00	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	8.9E+02	$\mu g/m^3$	1.2E-05	mg/m^3	NA	NA	NA	2.5E-02	mg/m^3	2.0E-01	mg/m3	1.3E-01
				1,2,4-Trimethylbenzene	4.7E+02	$\mu g/m^3$	6.3E-06	mg/m^3	NA	NA	NA	1.3E-02	mg/m^3	2.0E-01	mg/m3	6.7E-02
				1,2-Dichloroethane	2.6E+02	$\mu g/m^3$	3.5E-06	mg/m^3	2.6E-05	1/(ug/m3)	9.1E-08	7.5E-03	mg/m^3	7.0E-02	mg/m3	1.1E-01
				1,3,5-Trimethylbenzene	1.2E+02	$\mu g/m^3$	1.6E-06	mg/m^3	NA	NA	NA	3.4E-03	mg/m^3	2.0E-01	mg/m3	1.7E-02
				Acetone	2.6E+04	$\mu g/m^3$	3.5E-04	mg/m^3	NA	NA	NA	7.4E-01	mg/m^3	NA	NA	NA
				Benzene	7.6E+02	$\mu g/m^3$	1.0E-05	mg/m^3	7.8E-06	1/(ug/m3)	7.9E-08	2.2E-02	mg/m^3	8.0E-02	mg/m3	2.7E-01
				Chloroethane	7.0E+03	$\mu g/m^3$	9.5E-05	mg/m^3	NA	NA	NA	2.0E-01	mg/m^3	4.0E+00	mg/m3	5.0E-02
				Chloroform	2.6E+00	$\mu g/m^3$	3.5E-08	mg/m^3	2.3E-05	1/(ug/m3)	8.0E-10	7.4E-05	mg/m^3	2.4E-01	mg/m3	3.1E-04
				cis-1,2-Dichloroethene	1.7E+04	$\mu g/m^3$	5.3E-03	mg/m^3	NA	NA	NA	1.1E+01	mg/m^3	4.0E-01	mg/m3	2.8E+01
				Ethylbenzene	5.2E+02	$\mu g/m^3$	1.7E-04	mg/m^3	2.5E-06	1/(ug/m3)	4.2E-07	3.6E-01	mg/m^3	9.0E+00	mg/m3	4.0E-02
				Methyl ethyl ketone	2.4E+04	$\mu g/m^3$	7.7E-03	mg/m^3	NA	NA	NA	1.6E+01	mg/m^3	1.0E+00	mg/m3	1.6E+01
				Methyl isobutyl ketone	9.8E+03	$\mu g/m^3$	3.2E-03	mg/m^3	NA	NA	NA	6.8E+00	mg/m^3	8.0E-01	mg/m3	8.5E+00
				Methylene chloride	1.4E+03	$\mu g/m^3$	4.5E-04	mg/m^3	1.0E-08	1/(ug/m3)	4.5E-09	9.7E-01	mg/m^3	1.0E+00	mg/m3	9.3E-01
				Tetrachloroethene	1.5E+02	$\mu g/m^3$	4.8E-05	mg/m^3	2.6E-07	1/(ug/m3)	1.2E-08	1.0E-01	mg/m^3	4.0E-02	mg/m3	2.5E+00
				Toluene	1.6E+04	$\mu g/m^3$	5.2E-03	mg/m^3	NA	NA	NA	1.1E+01	mg/m^3	5.0E+00	mg/m3	2.2E+00
				Trichloroethene	5.9E+02	$\mu g/m^3$	1.9E-04	mg/m^3	4.1E-06	1/(ug/m3)	7.8E-07	4.0E-01	mg/m^3	2.0E-03	mg/m3	2.0E+02
				Vinyl chloride	1.8E+03	$\mu g/m^3$	5.9E-04	mg/m^3	8.8E-06	1/(ug/m3)	5.2E-06	1.3E+00	mg/m^3	7.7E-02	mg/m3	1.6E+01
				Xylene, m,p-	2.1E+03	$\mu g/m^3$	6.9E-04	mg/m^3	NA	NA	NA	1.5E+00	mg/m^3	4.0E-01	mg/m3	3.7E+00
				Xylene, o-	7.0E+02	$\mu g/m^3$	2.3E-04	mg/m^3	NA	NA	NA	4.8E-01	mg/m^3	4.0E-01	mg/m3	1.2E+00
			Exp. Route Total								7.5E-06					2.8E+02
		Exposure Point Total									7.5E-06					2.8E+02
	Exposure Medium Total										7.5E-06					2.8E+02
Groundwater Total											7.6E-06					2.8E+02
Receptor Total											8E-06					3E+02

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future

Receptor Population: Construction/Utility Worker

Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	

Notes:

bgs = below ground surface

CSF = Cancer slope factor

EPC = Exposure point concentration

NA = Not applicable/Not available

RfC = Reference concentration

RfD = Reference dose

µg/L = microgram per liter

µg/m^3= microgram per cubic meter

mg/m^3= milligram per cubic meter

mg/kg = milligram per kilogram

mg/kg/day = milligram per kilogram per day

TABLE 7.5.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
2-Amino-4,6-dinitrotoluene	1.2E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	1.0	7.8E-09	1
4-Amino-2,6-dinitrotoluene	4.4E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	1.0	2.9E-08	1
RDX	5.1E+00	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	1.0	6.4E-09	1
Arsenic	5.6E+01	1.0E-03	NA	NA	NA	NA	1.0	5.6E-08	1
Barium	2.0E+03	1.0E-03	NA	NA	NA	NA	1.0	2.0E-06	1
Naphthalene	1.0E+01	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	1.0	9.5E-07	1
1,1,1-Trichloroethane	2.0E+03	1.3E-02	5.6E-02	5.9E-01	1.4E+00	1.0E+00	1.0	5.3E-05	1
1,1,2-Trichloroethane	6.4E-01	5.0E-03	2.2E-02	5.9E-01	1.4E+00	1.0E+00	1.0	6.8E-09	1
1,1-Dichloroethane	4.9E+03	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	1.0	5.8E-05	2
1,1-Dichloroethene	1.1E+02	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	1.0	2.1E-06	2
1,2,4-Trimethylbenzene	6.3E+01	8.6E-02	3.6E-01	5.0E-01	1.2E+00	1.0E+00	1.0	1.1E-05	1
1,2-Dichloroethane	3.3E+01	4.2E-03	1.6E-02	3.8E-01	9.0E-01	1.0E+00	1.0	2.4E-07	2
1,3,5-Trimethylbenzene	1.6E+01	6.2E-02	2.6E-01	5.0E-01	1.2E+00	1.0E+00	1.0	1.9E-06	2
Acetone	6.7E+03	5.1E-04	1.5E-03	2.2E-01	5.3E-01	1.0E+00	1.0	5.0E-06	3
Benzene	8.2E+01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	1.0	1.9E-06	3
Chloroethane	6.9E+02	6.1E-03	1.9E-02	2.4E-01	5.8E-01	1.0E+00	1.0	6.2E-06	3
Chloroform	3.5E-01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	1.0	4.6E-09	2
cis-1,2-Dichloroethene	2.0E+03	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	1.0	3.8E-05	3
Ethylbenzene	6.6E+01	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	1.0	5.9E-06	3
Methyl ethyl ketone	5.1E+03	9.6E-04	3.1E-03	2.7E-01	6.4E-01	1.0E+00	1.0	7.5E-06	3
Methyl isobutyl ketone	1.7E+03	3.2E-03	1.2E-02	3.8E-01	9.2E-01	1.0E+00	1.0	9.6E-06	3
Methylene chloride	1.6E+02	3.5E-03	1.3E-02	3.1E-01	7.5E-01	1.0E+00	1.0	9.2E-07	3
Tetrachloroethene	2.3E+01	3.3E-02	1.7E-01	8.9E-01	2.1E+00	1.0E+00	1.0	2.0E-06	2
Toluene	1.9E+03	3.1E-02	1.1E-01	3.5E-01	8.3E-01	1.0E+00	1.0	9.8E-05	3
Trichloroethene	8.2E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	1.0	2.0E-06	2
Vinyl chloride	1.8E+02	8.4E-03	2.5E-02	2.4E-01	5.7E-01	1.0E+00	1.0	2.2E-06	3
Xylene, m,p-	2.7E+02	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	1.0	2.5E-05	3
Xylene, o-	8.9E+01	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	1.0	8.1E-06	3

TABLE 7.5.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =

$2 \times FA \times Kp \times Cw \times (sqrt((6 \times \tau \times t_{event}) / (3.1415))) \times CF1 \times CF2$ (Eq 1)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =

$FA \times Kp \times CW \times (t_{event}/(1+B) + 2 \times \tau \times ((1 + 3B + 3B^2)/(1+B)^2)) \times CF1 \times CF2$ (Eq 2)

Notes:

Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.

B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).

cm/hr - centimeter per hour

hr - hour

mg/cm^2-event - milligram per square centimeter per event

µg/L - microgram per liter

NA - Not applicable

t* - Time to reach steady-state

CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air	Indoor Air	Inhalation	1,1,1-Trichloroethane	8.4E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	8.1E-01	mg/m^3	5.0E+00	mg/m3	1.6E-01
	(Vapor Intrusion)	(Vapor Intrusion)		1,1,2-Trichloroethane	4.5E-02	$\mu g/m^3$	NA	NA	NA	NA	NA	4.3E-05	mg/m^3	2.0E-04	mg/m3	2.1E-01
				1,1-Dichloroethane	6.9E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	6.7E-01	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	1.9E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	1.8E-01	mg/m^3	2.0E-01	mg/m3	9.1E-01
				1,2,4-Trimethylbenzene	1.3E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	1.2E-02	mg/m^3	6.0E-02	mg/m3	2.0E-01
				1,2-Dichloroethane	2.2E+00	$\mu g/m^3$	NA	NA	NA	NA	NA	2.1E-03	mg/m^3	7.0E-03	mg/m3	3.1E-01
				Benzene	1.2E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	1.1E-02	mg/m^3	3.0E-02	mg/m3	3.7E-01
				cis-1,2-Dichloroethene	2.0E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	1.9E-01	mg/m^3	4.0E-02	mg/m3	4.8E+00
				Ethylbenzene	2.1E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	2.0E-02	mg/m^3	1.0E+00	mg/m3	2.0E-02
				Tetrachloroethene	2.3E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	2.2E-02	mg/m^3	4.0E-02	mg/m3	5.4E-01
				Trichloroethene	1.9E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	1.8E-02	mg/m^3	2.0E-03	mg/m3	9.2E+00
				Vinyl chloride	4.3E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	4.2E-01	mg/m^3	1.0E-01	mg/m3	4.2E+00
				Xylene, m,p-	8.5E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	8.1E-02	mg/m^3	1.0E-01	mg/m3	8.1E-01
				Xylene, o-	2.2E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	2.1E-02	mg/m^3	1.0E-01	mg/m3	2.1E-01
			Exp. Route Total								NA					2.2E+01
		Exposure Point Total									NA					2.2E+01
	Exposure Medium Total										NA					2.2E+01

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	NA	NA	NA	NA	NA	3.6E-05	mg/kg/day	1.0E-04	mg/kg/day	3.6E-01
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	NA	NA	NA	NA	NA	1.3E-04	mg/kg/day	1.0E-04	mg/kg/day	1.3E+00
				RDX	5.1E+00	µg/L	NA	NA	NA	NA	NA	1.5E-04	mg/kg/day	4.0E-03	mg/kg/day	3.8E-02
				Arsenic	5.6E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	3.0E-04	mg/kg/day	5.6E+00
				Barium	2.0E+03	µg/L	NA	NA	NA	NA	NA	6.0E-02	mg/kg/day	2.0E-01	mg/kg/day	3.0E-01
				1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	4.8E-02	mg/kg/day	2.0E+00	mg/kg/day	2.4E-02
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	3.5E-05	mg/kg/day	4.0E-03	mg/kg/day	8.7E-03
				1,1-Dichloroethane	4.9E+03	µg/L	NA	NA	NA	NA	NA	1.5E-01	mg/kg/day	2.0E-01	mg/kg/day	7.3E-01
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	3.0E-03	mg/kg/day	5.0E-02	mg/kg/day	6.0E-02
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.0E-03	mg/kg/day	1.0E-02	mg/kg/day	1.0E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	6.8E-04	mg/kg/day	6.0E-03	mg/kg/day	1.1E-01
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	3.0E-04	mg/kg/day	1.0E-02	mg/kg/day	3.0E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	2.0E-01	mg/kg/day	9.0E-01	mg/kg/day	2.2E-01
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.1E-03	mg/kg/day	4.0E-03	mg/kg/day	2.6E-01
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	9.6E-03	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	1.0E-05	mg/kg/day	1.0E-02	mg/kg/day	1.0E-03
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	5.5E-02	mg/kg/day	2.0E-03	mg/kg/day	2.7E+01
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	1.2E-03	mg/kg/day	1.0E-01	mg/kg/day	1.2E-02
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	1.5E-01	mg/kg/day	6.0E-01	mg/kg/day	2.5E-01
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	5.1E-02	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/kg/day	6.0E-03	mg/kg/day	8.0E-01
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	3.0E-04	mg/kg/day	2.0E-02	mg/kg/day	1.5E-02
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	6.0E-03	mg/kg/day	2.8E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	3.1E-02	mg/kg/day	8.0E-02	mg/kg/day	3.8E-01
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	8.1E-04	mg/kg/day	5.0E-04	mg/kg/day	1.6E+00
				Vinyl chloride	5.1E+02	µg/L	NA	NA	NA	NA	NA	1.5E-02	mg/kg/day	3.0E-03	mg/kg/day	5.1E+00
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/kg/day	2.0E-01	mg/kg/day	2.4E-02
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	2.0E-01	mg/kg/day	8.6E-03
			Exp. Route Total								NA					4.5E+01

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Dermal	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	NA	NA	NA	NA	NA	1.6E-06	mg/kg/day	1.0E-04	mg/kg/day	1.6E-02
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	NA	NA	NA	NA	NA	5.7E-06	mg/kg/day	1.0E-04	mg/kg/day	5.7E-02
				RDX	5.1E+00	µg/L	NA	NA	NA	NA	NA	1.3E-06	mg/kg/day	4.0E-03	mg/kg/day	3.2E-04
				Arsenic	5.6E+01	µg/L	NA	NA	NA	NA	NA	9.4E-06	mg/kg/day	3.0E-04	mg/kg/day	3.1E-02
				Barium	2.0E+03	µg/L	NA	NA	NA	NA	NA	3.3E-04	mg/kg/day	1.4E-02	mg/kg/day	2.4E-02
				1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	8.5E-03	mg/kg/day	2.0E+00	mg/kg/day	4.2E-03
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	2.5E-06	mg/kg/day	4.0E-03	mg/kg/day	6.2E-04
				1,1-Dichloroethane	4.9E+03	µg/L	NA	NA	NA	NA	NA	1.1E-02	mg/kg/day	2.0E-01	mg/kg/day	5.6E-02
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	3.9E-04	mg/kg/day	5.0E-02	mg/kg/day	7.8E-03
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.1E-03	mg/kg/day	1.0E-02	mg/kg/day	1.1E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	3.2E-05	mg/kg/day	6.0E-03	mg/kg/day	5.4E-03
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	2.4E-04	mg/kg/day	1.0E-02	mg/kg/day	2.4E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	9.3E-04	mg/kg/day	9.0E-01	mg/kg/day	1.0E-03
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.6E-04	mg/kg/day	4.0E-03	mg/kg/day	4.0E-02
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	5.5E-04	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	9.2E-07	mg/kg/day	1.0E-02	mg/kg/day	9.2E-05
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	6.7E-03	mg/kg/day	2.0E-03	mg/kg/day	3.3E+00
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	6.7E-04	mg/kg/day	1.0E-01	mg/kg/day	6.7E-03
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	6.0E-01	mg/kg/day	2.4E-03
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	1.8E-03	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	1.7E-04	mg/kg/day	6.0E-03	mg/kg/day	2.9E-02
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	1.9E-04	mg/kg/day	2.0E-02	mg/kg/day	9.5E-03
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	9.8E-04	mg/kg/day	6.0E-03	mg/kg/day	1.6E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	1.0E-02	mg/kg/day	8.0E-02	mg/kg/day	1.3E-01
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	1.3E-04	mg/kg/day	5.0E-04	mg/kg/day	2.6E-01
				Vinyl chloride	5.1E+02	µg/L	NA	NA	NA	NA	NA	1.2E-03	mg/kg/day	3.0E-03	mg/kg/day	3.9E-01
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	2.0E-01	mg/kg/day	1.4E-02
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	1.0E-03	mg/kg/day	2.0E-01	mg/kg/day	5.1E-03
			Exp. Route Total								NA					4.7E+00
		Exposure Point Total									NA					5.0E+01
	Exposure Medium Total										NA					5.0E+01

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	7.7E-01	mg/m^3	5.0E+00	mg/m3	1.5E-01
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	5.6E-04	mg/m^3	2.0E-04	mg/m3	2.8E+00
				1,1-Dichloroethane	3.4E+03	µg/L	NA	NA	NA	NA	NA	1.6E+00	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	4.8E-02	mg/m^3	2.0E-01	mg/m3	2.4E-01
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.6E-02	mg/m^3	6.0E-02	mg/m3	2.7E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	1.1E-02	mg/m^3	7.0E-03	mg/m3	1.6E+00
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/m^3	6.0E-02	mg/m3	8.0E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	3.2E+00	mg/m^3	NA	NA	NA
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.7E-02	mg/m^3	3.0E-02	mg/m3	5.6E-01
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	1.5E-01	mg/m^3	4.0E+00	mg/m3	3.9E-02
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	1.7E-04	mg/m^3	9.8E-02	mg/m3	1.7E-03
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	8.8E-01	mg/m^3	4.0E-02	mg/m3	2.2E+01
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	1.8E-02	mg/m^3	1.0E+00	mg/m3	1.8E-02
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	2.4E+00	mg/m^3	5.0E+00	mg/m3	4.9E-01
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	8.2E-01	mg/m^3	3.0E+00	mg/m3	2.7E-01
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	7.7E-02	mg/m^3	6.0E-01	mg/m3	1.3E-01
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/m^3	3.0E-03	mg/m3	1.6E+00
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.7E-02	mg/m^3	4.0E-02	mg/m3	6.8E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	4.9E-01	mg/m^3	5.0E+00	mg/m3	9.8E-02
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	1.3E-02	mg/m^3	2.0E-03	mg/m3	6.5E+00
				Vinyl chloride	3.6E+02	µg/L	NA	NA	NA	NA	NA	1.7E-01	mg/m^3	1.0E-01	mg/m3	1.7E+00
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	7.7E-02	mg/m^3	1.0E-01	mg/m3	7.7E-01
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	2.8E-02	mg/m^3	1.0E-01	mg/m3	2.8E-01
			Exp. Route Total								NA					4.0E+01
		Exposure Point Total									NA					4.0E+01
	Exposure Medium Total										NA					4.0E+01
Groundwater Total											NA					1.1E+02
Receptor Total											NA					1E+02

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.6.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
2-Amino-4,6-dinitrotoluene	1.2E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	6.6E-09	2
4-Amino-2,6-dinitrotoluene	4.4E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.71	2.4E-08	2
RDX	5.1E+00	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.71	5.4E-09	2
Arsenic	5.6E+01	1.0E-03	NA	NA	NA	NA	0.71	4.0E-08	1
Barium	2.0E+03	1.0E-03	NA	NA	NA	NA	0.71	1.4E-06	1
1,1,1-Trichloroethane	1.6E+03	1.3E-02	5.6E-02	5.9E-01	1.4E+00	1.0E+00	0.71	3.6E-05	2
1,1,2-Trichloroethane	1.2E+00	5.0E-03	2.2E-02	5.9E-01	1.4E+00	1.0E+00	0.71	1.0E-08	2
1,1-Dichloroethane	4.9E+03	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.71	4.7E-05	2
1,1-Dichloroethene	1.0E+02	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.71	1.6E-06	2
1,2,4-Trimethylbenzene	3.3E+01	8.6E-02	3.6E-01	5.0E-01	1.2E+00	1.0E+00	0.71	4.7E-06	2
1,2-Dichloroethane	2.3E+01	4.2E-03	1.6E-02	3.8E-01	9.0E-01	1.0E+00	0.71	1.4E-07	2
1,3,5-Trimethylbenzene	1.0E+01	6.2E-02	2.6E-01	5.0E-01	1.2E+00	1.0E+00	0.71	1.0E-06	2
Acetone	6.7E+03	5.1E-04	1.5E-03	2.2E-01	5.3E-01	1.0E+00	0.71	4.0E-06	3
Benzene	3.5E+01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.71	6.7E-07	3
Chloroethane	3.2E+02	6.1E-03	1.9E-02	2.4E-01	5.8E-01	1.0E+00	0.71	2.3E-06	3
Chloroform	3.5E-01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.71	3.9E-09	2
cis-1,2-Dichloroethene	1.8E+03	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.71	2.8E-05	2
Ethylbenzene	3.9E+01	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.71	2.8E-06	2
Methyl ethyl ketone	5.1E+03	9.6E-04	3.1E-03	2.7E-01	6.4E-01	1.0E+00	0.71	6.1E-06	3
Methyl isobutyl ketone	1.7E+03	3.2E-03	1.2E-02	3.8E-01	9.2E-01	1.0E+00	0.71	7.8E-06	2
Methylene chloride	1.6E+02	3.5E-03	1.3E-02	3.1E-01	7.5E-01	1.0E+00	0.71	7.4E-07	2
Naphthalene	1.0E+01	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.71	8.0E-07	2
Tetrachloroethene	5.7E+01	3.3E-02	1.7E-01	8.9E-01	2.1E+00	1.0E+00	0.71	4.2E-06	2
Toluene	1.0E+03	3.1E-02	1.1E-01	3.5E-01	8.3E-01	1.0E+00	0.71	4.4E-05	2
Trichloroethene	2.7E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.71	5.5E-07	2
Vinyl chloride	5.1E+02	8.4E-03	2.5E-02	2.4E-01	5.7E-01	1.0E+00	0.71	5.0E-06	3
Xylene, m,p-	1.6E+02	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.71	1.2E-05	2
Xylene, o-	5.8E+01	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.71	4.3E-06	2

TABLE 7.6.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \le t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air	Indoor Air	Inhalation	1,1,1-Trichloroethane	8.4E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	8.1E-01	mg/m^3	5.0E+00	mg/m3	1.6E-01
	(Vapor Intrusion)	(Vapor Intrusion)		1,1,2-Trichloroethane	4.5E-02	$\mu g/m^3$	NA	NA	NA	NA	NA	4.3E-05	mg/m^3	2.0E-04	mg/m3	2.1E-01
				1,1-Dichloroethane	6.9E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	6.7E-01	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	1.9E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	1.8E-01	mg/m^3	2.0E-01	mg/m3	9.1E-01
				1,2,4-Trimethylbenzene	1.3E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	1.2E-02	mg/m^3	6.0E-02	mg/m3	2.0E-01
				1,2-Dichloroethane	2.2E+00	$\mu g/m^3$	NA	NA	NA	NA	NA	2.1E-03	mg/m^3	7.0E-03	mg/m3	3.1E-01
				Benzene	1.2E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	1.1E-02	mg/m^3	3.0E-02	mg/m3	3.7E-01
				cis-1,2-Dichloroethene	2.0E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	1.9E-01	mg/m^3	4.0E-02	mg/m3	4.8E+00
				Ethylbenzene	2.1E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	2.0E-02	mg/m^3	1.0E+00	mg/m3	2.0E-02
				Tetrachloroethene	2.3E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	2.2E-02	mg/m^3	4.0E-02	mg/m3	5.4E-01
				Trichloroethene	1.9E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	1.8E-02	mg/m^3	2.0E-03	mg/m3	9.2E+00
				Vinyl chloride	4.3E+02	$\mu g/m^3$	NA	NA	NA	NA	NA	4.2E-01	mg/m^3	1.0E-01	mg/m3	4.2E+00
				Xylene, m,p-	8.5E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	8.1E-02	mg/m^3	1.0E-01	mg/m3	8.1E-01
				Xylene, o-	2.2E+01	$\mu g/m^3$	NA	NA	NA	NA	NA	2.1E-02	mg/m^3	1.0E-01	mg/m3	2.1E-01
			Exp. Route Total								NA					2.2E+01
		Exposure Point Total									NA					2.2E+01
	Exposure Medium Total										NA					2.2E+01

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	NA	NA	NA	NA	NA	6.0E-05	mg/kg/day	1.0E-04	mg/kg/day	6.0E-01
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	NA	NA	NA	NA	NA	2.2E-04	mg/kg/day	1.0E-04	mg/kg/day	2.2E+00
				RDX	5.1E+00	µg/L	NA	NA	NA	NA	NA	2.5E-04	mg/kg/day	4.0E-03	mg/kg/day	6.4E-02
				Arsenic	5.6E+01	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	3.0E-04	mg/kg/day	9.3E+00
				Barium	2.0E+03	µg/L	NA	NA	NA	NA	NA	1.0E-01	mg/kg/day	2.0E-01	mg/kg/day	5.0E-01
				1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	8.0E-02	mg/kg/day	2.0E+00	mg/kg/day	4.0E-02
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	5.8E-05	mg/kg/day	4.0E-03	mg/kg/day	1.4E-02
				1,1-Dichloroethane	4.9E+03	µg/L	NA	NA	NA	NA	NA	2.4E-01	mg/kg/day	2.0E-01	mg/kg/day	1.2E+00
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	5.0E-03	mg/kg/day	5.0E-02	mg/kg/day	1.0E-01
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	1.0E-02	mg/kg/day	1.7E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	1.1E-03	mg/kg/day	6.0E-03	mg/kg/day	1.9E-01
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	5.0E-04	mg/kg/day	1.0E-02	mg/kg/day	5.0E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	3.3E-01	mg/kg/day	9.0E-01	mg/kg/day	3.7E-01
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.8E-03	mg/kg/day	4.0E-03	mg/kg/day	4.4E-01
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	1.6E-02	mg/kg/day	NA	NA	NA
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	1.7E-05	mg/kg/day	1.0E-02	mg/kg/day	1.7E-03
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	9.1E-02	mg/kg/day	2.0E-03	mg/kg/day	4.6E+01
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	1.9E-03	mg/kg/day	1.0E-01	mg/kg/day	1.9E-02
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	2.5E-01	mg/kg/day	6.0E-01	mg/kg/day	4.2E-01
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	8.5E-02	mg/kg/day	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	8.0E-03	mg/kg/day	6.0E-03	mg/kg/day	1.3E+00
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	5.0E-04	mg/kg/day	2.0E-02	mg/kg/day	2.5E-02
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	6.0E-03	mg/kg/day	4.7E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	5.1E-02	mg/kg/day	8.0E-02	mg/kg/day	6.4E-01
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	1.3E-03	mg/kg/day	5.0E-04	mg/kg/day	2.7E+00
				Vinyl chloride	5.1E+02	µg/L	NA	NA	NA	NA	NA	2.5E-02	mg/kg/day	3.0E-03	mg/kg/day	8.5E+00
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	8.0E-03	mg/kg/day	2.0E-01	mg/kg/day	4.0E-02
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	2.9E-03	mg/kg/day	2.0E-01	mg/kg/day	1.4E-02
			Exp. Route Total								NA					7.5E+01

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Dermal	2-Amino-4,6-dinitrotoluene	1.20E+00	µg/L	NA	NA	NA	NA	NA	2.3E-06	mg/kg/day	1.0E-04	mg/kg/day	2.3E-02
(cont.)				4-Amino-2,6-dinitrotoluene	4.40E+00	µg/L	NA	NA	NA	NA	NA	8.6E-06	mg/kg/day	1.0E-04	mg/kg/day	8.6E-02
				RDX	5.10E+00	µg/L	NA	NA	NA	NA	NA	1.9E-06	mg/kg/day	4.0E-03	mg/kg/day	4.8E-04
				Arsenic	5.60E+01	µg/L	NA	NA	NA	NA	NA	1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	4.1E-02
				Barium	2.00E+03	µg/L	NA	NA	NA	NA	NA	4.4E-04	mg/kg/day	1.4E-02	mg/kg/day	3.1E-02
				1,1,1-Trichloroethane	1.60E+03	µg/L	NA	NA	NA	NA	NA	1.3E-02	mg/kg/day	2.0E+00	mg/kg/day	6.4E-03
				1,1,2-Trichloroethane	1.16E+00	µg/L	NA	NA	NA	NA	NA	3.7E-06	mg/kg/day	4.0E-03	mg/kg/day	9.3E-04
				1,1-Dichloroethane	4.90E+03	µg/L	NA	NA	NA	NA	NA	1.7E-02	mg/kg/day	2.0E-01	mg/kg/day	8.4E-02
				1,1-Dichloroethene	9.99E+01	µg/L	NA	NA	NA	NA	NA	5.9E-04	mg/kg/day	5.0E-02	mg/kg/day	1.2E-02
				1,2,4-Trimethylbenzene	3.35E+01	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	1.0E-02	mg/kg/day	1.7E-01
				1,2-Dichloroethane	2.28E+01	µg/L	NA	NA	NA	NA	NA	4.8E-05	mg/kg/day	6.0E-03	mg/kg/day	8.1E-03
				1,3,5-Trimethylbenzene	9.96E+00	µg/L	NA	NA	NA	NA	NA	3.6E-04	mg/kg/day	1.0E-02	mg/kg/day	3.6E-02
				Acetone	6.70E+03	µg/L	NA	NA	NA	NA	NA	1.4E-03	mg/kg/day	9.0E-01	mg/kg/day	1.5E-03
				Benzene	3.52E+01	µg/L	NA	NA	NA	NA	NA	2.3E-04	mg/kg/day	4.0E-03	mg/kg/day	5.8E-02
				Chloroethane	3.22E+02	µg/L	NA	NA	NA	NA	NA	7.9E-04	mg/kg/day	NA	NA	NA
				Chloroform	3.50E-01	µg/L	NA	NA	NA	NA	NA	1.4E-06	mg/kg/day	1.0E-02	mg/kg/day	1.4E-04
				cis-1,2-Dichloroethene	1.83E+03	µg/L	NA	NA	NA	NA	NA	1.0E-02	mg/kg/day	2.0E-03	mg/kg/day	5.0E+00
				Ethylbenzene	3.85E+01	µg/L	NA	NA	NA	NA	NA	1.0E-03	mg/kg/day	1.0E-01	mg/kg/day	1.0E-02
				Methyl ethyl ketone	5.10E+03	µg/L	NA	NA	NA	NA	NA	2.1E-03	mg/kg/day	6.0E-01	mg/kg/day	3.5E-03
				Methyl isobutyl ketone	1.70E+03	µg/L	NA	NA	NA	NA	NA	2.8E-03	mg/kg/day	NA	NA	NA
				Methylene chloride	1.60E+02	µg/L	NA	NA	NA	NA	NA	2.6E-04	mg/kg/day	6.0E-03	mg/kg/day	4.4E-02
				Naphthalene	1.00E+01	µg/L	NA	NA	NA	NA	NA	2.9E-04	mg/kg/day	2.0E-02	mg/kg/day	1.4E-02
				Tetrachloroethene	5.67E+01	µg/L	NA	NA	NA	NA	NA	1.5E-03	mg/kg/day	6.0E-03	mg/kg/day	2.5E-01
				Toluene	1.03E+03	µg/L	NA	NA	NA	NA	NA	1.5E-02	mg/kg/day	8.0E-02	mg/kg/day	1.9E-01
				Trichloroethene	2.71E+01	µg/L	NA	NA	NA	NA	NA	2.0E-04	mg/kg/day	5.0E-04	mg/kg/day	3.9E-01
				Vinyl chloride	5.10E+02	µg/L	NA	NA	NA	NA	NA	1.7E-03	mg/kg/day	3.0E-03	mg/kg/day	5.7E-01
				Xylene, m,p-	1.60E+02	µg/L	NA	NA	NA	NA	NA	4.2E-03	mg/kg/day	2.0E-01	mg/kg/day	2.1E-02
				Xylene, o-	5.77E+01	µg/L	NA	NA	NA	NA	NA	1.5E-03	mg/kg/day	2.0E-01	mg/kg/day	7.7E-03
			Exp. Route Total								NA					7.1E+00
		Exposure Point Total									NA					8.2E+01
	Exposure Medium Total										NA					8.2E+01

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	1,1,1-Trichloroethane	1.6E+03	µg/L	NA	NA	NA	NA	NA	7.7E-01	mg/m^3	5.0E+00	mg/m3	1.5E-01
				1,1,2-Trichloroethane	1.2E+00	µg/L	NA	NA	NA	NA	NA	5.6E-04	mg/m^3	2.0E-04	mg/m3	2.8E+00
				1,1-Dichloroethane	3.4E+03	µg/L	NA	NA	NA	NA	NA	1.6E+00	mg/m^3	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	NA	NA	NA	NA	NA	4.8E-02	mg/m^3	2.0E-01	mg/m3	2.4E-01
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	NA	NA	NA	NA	NA	1.6E-02	mg/m^3	6.0E-02	mg/m3	2.7E-01
				1,2-Dichloroethane	2.3E+01	µg/L	NA	NA	NA	NA	NA	1.1E-02	mg/m^3	7.0E-03	mg/m3	1.6E+00
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/m^3	6.0E-02	mg/m3	8.0E-02
				Acetone	6.7E+03	µg/L	NA	NA	NA	NA	NA	3.2E+00	mg/m^3	NA	NA	NA
				Benzene	3.5E+01	µg/L	NA	NA	NA	NA	NA	1.7E-02	mg/m^3	3.0E-02	mg/m3	5.6E-01
				Chloroethane	3.2E+02	µg/L	NA	NA	NA	NA	NA	1.5E-01	mg/m^3	4.0E+00	mg/m3	3.9E-02
				Chloroform	3.5E-01	µg/L	NA	NA	NA	NA	NA	1.7E-04	mg/m^3	9.8E-02	mg/m3	1.7E-03
				cis-1,2-Dichloroethene	1.8E+03	µg/L	NA	NA	NA	NA	NA	8.8E-01	mg/m^3	4.0E-02	mg/m3	2.2E+01
				Ethylbenzene	3.9E+01	µg/L	NA	NA	NA	NA	NA	1.8E-02	mg/m^3	1.0E+00	mg/m3	1.8E-02
				Methyl ethyl ketone	5.1E+03	µg/L	NA	NA	NA	NA	NA	2.4E+00	mg/m^3	5.0E+00	mg/m3	4.9E-01
				Methyl isobutyl ketone	1.7E+03	µg/L	NA	NA	NA	NA	NA	8.2E-01	mg/m^3	3.0E+00	mg/m3	2.7E-01
				Methylene chloride	1.6E+02	µg/L	NA	NA	NA	NA	NA	7.7E-02	mg/m^3	6.0E-01	mg/m3	1.3E-01
				Naphthalene	1.0E+01	µg/L	NA	NA	NA	NA	NA	4.8E-03	mg/m^3	3.0E-03	mg/m3	1.6E+00
				Tetrachloroethene	5.7E+01	µg/L	NA	NA	NA	NA	NA	2.7E-02	mg/m^3	4.0E-02	mg/m3	6.8E-01
				Toluene	1.0E+03	µg/L	NA	NA	NA	NA	NA	4.9E-01	mg/m^3	5.0E+00	mg/m3	9.8E-02
				Trichloroethene	2.7E+01	µg/L	NA	NA	NA	NA	NA	1.3E-02	mg/m^3	2.0E-03	mg/m3	6.5E+00
				Vinyl chloride	3.6E+02	µg/L	NA	NA	NA	NA	NA	1.7E-01	mg/m^3	1.0E-01	mg/m3	1.7E+00
				Xylene, m,p-	1.6E+02	µg/L	NA	NA	NA	NA	NA	7.7E-02	mg/m^3	1.0E-01	mg/m3	7.7E-01
				Xylene, o-	5.8E+01	µg/L	NA	NA	NA	NA	NA	2.8E-02	mg/m^3	1.0E-01	mg/m3	2.8E-01
			Exp. Route Total								NA					4.0E+01
		Exposure Point Total									NA					4.0E+01
	Exposure Medium Total										NA					4.0E+01
Groundwater Total											NA					1.4E+02
Receptor Total											NA					1E+02

TABLE 7.7.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.7.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
2-Amino-4,6-dinitrotoluene	1.2E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	5.7E-09	2
4-Amino-2,6-dinitrotoluene	4.4E+00	2.0E-03	1.1E-02	1.3E+00	3.2E+00	1.0E+00	0.54	2.1E-08	2
RDX	5.1E+00	3.4E-04	1.9E-03	1.8E+00	4.4E+00	1.0E+00	0.54	4.7E-09	2
Arsenic	5.6E+01	1.0E-03	NA	NA	NA	NA	0.54	3.0E-08	1
Barium	2.0E+03	1.0E-03	NA	NA	NA	NA	0.54	1.1E-06	1
1,1,1-Trichloroethane	1.6E+03	1.3E-02	5.6E-02	5.9E-01	1.4E+00	1.0E+00	0.54	3.1E-05	2
1,1,2-Trichloroethane	1.2E+00	5.0E-03	2.2E-02	5.9E-01	1.4E+00	1.0E+00	0.54	9.1E-09	2
1,1-Dichloroethane	4.9E+03	6.8E-03	2.6E-02	3.8E-01	9.0E-01	1.0E+00	0.54	4.1E-05	2
1,1-Dichloroethene	1.0E+02	1.2E-02	4.4E-02	3.7E-01	8.8E-01	1.0E+00	0.54	1.4E-06	2
1,2,4-Trimethylbenzene	3.3E+01	8.6E-02	3.6E-01	5.0E-01	1.2E+00	1.0E+00	0.54	4.1E-06	2
1,2-Dichloroethane	2.3E+01	4.2E-03	1.6E-02	3.8E-01	9.0E-01	1.0E+00	0.54	1.2E-07	2
1,3,5-Trimethylbenzene	1.0E+01	6.2E-02	2.6E-01	5.0E-01	1.2E+00	1.0E+00	0.54	8.8E-07	2
Acetone	6.7E+03	5.1E-04	1.5E-03	2.2E-01	5.3E-01	1.0E+00	0.54	3.4E-06	3
Benzene	3.5E+01	1.5E-02	5.1E-02	2.9E-01	6.9E-01	1.0E+00	0.54	5.7E-07	2
Chloroethane	3.2E+02	6.1E-03	1.9E-02	2.4E-01	5.8E-01	1.0E+00	0.54	2.0E-06	2
Chloroform	3.5E-01	6.8E-03	2.9E-02	4.9E-01	1.2E+00	1.0E+00	0.54	3.4E-09	2
cis-1,2-Dichloroethene	1.8E+03	1.1E-02	4.2E-02	3.7E-01	8.8E-01	1.0E+00	0.54	2.5E-05	2
Ethylbenzene	3.9E+01	4.9E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.54	2.5E-06	2
Methyl ethyl ketone	5.1E+03	9.6E-04	3.1E-03	2.7E-01	6.4E-01	1.0E+00	0.54	5.1E-06	2
Methyl isobutyl ketone	1.7E+03	3.2E-03	1.2E-02	3.8E-01	9.2E-01	1.0E+00	0.54	6.8E-06	2
Methylene chloride	1.6E+02	3.5E-03	1.3E-02	3.1E-01	7.5E-01	1.0E+00	0.54	6.5E-07	2
Naphthalene	1.0E+01	4.7E-02	2.0E-01	5.5E-01	1.3E+00	1.0E+00	0.54	7.0E-07	2
Tetrachloroethene	5.7E+01	3.3E-02	1.7E-01	8.9E-01	2.1E+00	1.0E+00	0.54	3.6E-06	2
Toluene	1.0E+03	3.1E-02	1.1E-01	3.5E-01	8.3E-01	1.0E+00	0.54	3.8E-05	2
Trichloroethene	2.7E+01	1.2E-02	5.1E-02	5.7E-01	1.4E+00	1.0E+00	0.54	4.8E-07	2
Vinyl chloride	5.1E+02	8.4E-03	2.5E-02	2.4E-01	5.7E-01	1.0E+00	0.54	4.2E-06	2
Xylene, m,p-	1.6E+02	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.54	1.0E-05	2
Xylene, o-	5.8E+01	5.0E-02	2.0E-01	4.1E-01	9.9E-01	1.0E+00	0.54	3.8E-06	2

TABLE 7.7.RME SUPPLEMENT
CALCULATION OF DAEVENT
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Chemical of Potential Concern	Groundwater Concentration (CW) (ug/L)	Permeability Coefficient (Kp) (cm/hr)	B (dimensionless)	Lag Time (τ_{event}) (hr)	t* (hr)	Fraction Absorbed Water (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq

Inorganics: DAevent (mg/cm^2-event) =

DA_{event} = Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (Eq 1)

Organics: DAevent (mg/cm^2-event) =

DA_{event} = $t_{event} \leq t^*$: DA_{event} (mg/cm^2-event) =
2 x FA x Kp x Cw x (sqrt((6 x τ x t_{event}) / (3.1415))) x CF1 x CF2 (Eq 2)

$t_{event} > t^*$: DA_{event} (mg/cm^2-event) =
FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x ((1 + 3B + $3B^2$)/$(1+B)^2$)) xCF1 x CF2 (Eq 3)

Notes:
Values for permeability constants, B, tau, t*, and FA are from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005.
B - Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless).
cm/hr - centimeter per hour
hr - hour
mg/cm^2-event - milligram per square centimeter per event
µg/L - microgram per liter
NA - Not applicable
t* - Time to reach steady-state
CF1 - Conversion Factor 1 (0.001 mg/µg), CF2 - Conversion Factor 2 (0.001 L/cm^3)

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Groundwater	Indoor Air	Indoor Air	Inhalation	1,1,1-Trichloroethane	8.4E+02	μg/m^3	3.0E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
	(Vapor Intrusion)	(Vapor Intrusion)		1,1,2-Trichloroethane	4.5E-02	μg/m^3	1.6E-05	mg/m^3	1.6E-05	1/(ug/m3)	2.5E-07	NA	NA	NA	NA	NA
				1,1-Dichloroethane	6.9E+02	μg/m^3	2.5E-01	mg/m^3	1.6E-06	1/(ug/m3)	4.0E-04	NA	NA	NA	NA	NA
				1,1-Dichloroethene	1.9E+02	μg/m^3	6.8E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,2,4-Trimethylbenzene	1.3E+01	μg/m^3	4.5E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,2-Dichloroethane	2.2E+00	μg/m^3	7.9E-04	mg/m^3	2.6E-05	1/(ug/m3)	2.1E-05	NA	NA	NA	NA	NA
				Benzene	1.2E+01	μg/m^3	4.2E-03	mg/m^3	7.8E-06	1/(ug/m3)	3.3E-05	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	2.0E+02	μg/m^3	7.2E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	2.1E+01	μg/m^3	7.6E-03	mg/m^3	2.5E-06	1/(ug/m3)	1.9E-05	NA	NA	NA	NA	NA
				Tetrachloroethene	2.3E+01	μg/m^3	8.1E-03	mg/m^3	2.6E-07	1/(ug/m3)	2.1E-06	NA	NA	NA	NA	NA
				Trichloroethene	1.9E+01	μg/m^3	6.8E-03	mg/m^3	4.1E-06	1/(ug/m3)	4.0E-05	NA	NA	NA	NA	NA
				Vinyl chloride	4.3E+02	μg/m^3	1.5E-01	mg/m^3	8.8E-06	1/(ug/m3)	8.4E-04	NA	NA	NA	NA	NA
				Xylene, m,p-	8.5E+01	μg/m^3	3.0E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Xylene, o-	2.2E+01	μg/m^3	7.9E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								1.3E-03					NA
		Exposure Point Total									1.3E-03					NA
	Exposure Medium Total										1.3E-03					NA

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.)	Tapwater	Tapwater	Ingestion	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	1.5E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	5.6E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	5.1E+00	µg/L	6.5E-05	mg/kg/day	8.0E-02	1/(mg/kg/day)	5.2E-06	NA	NA	NA	NA	NA
				Arsenic	5.6E+01	µg/L	7.2E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	1.1E-03	NA	NA	NA	NA	NA
				Barium	2.0E+03	µg/L	2.6E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1,1-Trichloroethane	1.6E+03	µg/L	2.1E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1,2-Trichloroethane	1.2E+00	µg/L	1.5E-05	mg/kg/day	5.7E-02	1/(mg/kg/day)	8.5E-07	NA	NA	NA	NA	NA
				1,1-Dichloroethane	4.9E+03	µg/L	6.3E-02	mg/kg/day	5.7E-03	1/(mg/kg/day)	3.6E-04	NA	NA	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	1.3E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	4.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,2-Dichloroethane	2.3E+01	µg/L	2.9E-04	mg/kg/day	9.1E-02	1/(mg/kg/day)	2.7E-05	NA	NA	NA	NA	NA
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	1.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Acetone	6.7E+03	µg/L	8.6E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	3.5E+01	µg/L	4.5E-04	mg/kg/day	5.5E-02	1/(mg/kg/day)	2.5E-05	NA	NA	NA	NA	NA
				Chloroethane	3.2E+02	µg/L	4.1E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	3.5E-01	µg/L	4.5E-06	mg/kg/day	3.1E-02	1/(mg/kg/day)	1.4E-07	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	1.8E+03	µg/L	2.4E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	3.9E+01	µg/L	4.9E-04	mg/kg/day	1.1E-02	1/(mg/kg/day)	5.4E-06	NA	NA	NA	NA	NA
				Methyl ethyl ketone	5.1E+03	µg/L	6.5E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Methyl isobutyl ketone	1.7E+03	µg/L	2.2E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	2.1E-03	mg/kg/day	2.0E-03	1/(mg/kg/day)	1.3E-05	NA	NA	NA	NA	NA
				Naphthalene	1.0E+01	µg/L	1.3E-04	mg/kg/day	1.2E-01	1/(mg/kg/day)	1.5E-05	NA	NA	NA	NA	NA
				Tetrachloroethene	5.7E+01	µg/L	7.3E-04	mg/kg/day	2.1E-03	1/(mg/kg/day)	1.5E-06	NA	NA	NA	NA	NA
				Toluene	1.0E+03	µg/L	1.3E-02	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	2.7E+01	µg/L	3.5E-04	mg/kg/day	4.6E-02	1/(mg/kg/day)	2.3E-05	NA	NA	NA	NA	NA
				Vinyl chloride	5.1E+02	µg/L	6.5E-03	mg/kg/day	1.5E+00	1/(mg/kg/day)	6.4E-03	NA	NA	NA	NA	NA
				Xylene, m,p-	1.6E+02	µg/L	2.1E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Xylene, o-	5.8E+01	µg/L	7.4E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								8.0E-03					NA

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Tapwater	Tapwater	Dermal	2-Amino-4,6-dinitrotoluene	1.2E+00	µg/L	6.4E-07	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
(cont.)				4-Amino-2,6-dinitrotoluene	4.4E+00	µg/L	2.4E-06	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				RDX	5.1E+00	µg/L	5.3E-07	mg/kg/day	8.0E-02	1/(mg/kg/day)	4.2E-08	NA	NA	NA	NA	NA
				Arsenic	5.6E+01	µg/L	3.7E-06	mg/kg/day	1.5E+00	1/(mg/kg/day)	5.6E-06	NA	NA	NA	NA	NA
				Barium	2.0E+03	µg/L	1.3E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1,1-Trichloroethane	1.6E+03	µg/L	3.5E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,1,2-Trichloroethane	1.2E+00	µg/L	1.0E-06	mg/kg/day	5.7E-02	1/(mg/kg/day)	5.8E-08	NA	NA	NA	NA	NA
				1,1-Dichloroethane	4.9E+03	µg/L	4.6E-03	mg/kg/day	5.7E-03	1/(mg/kg/day)	2.6E-05	NA	NA	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	1.6E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	4.6E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				1,2-Dichloroethane	2.3E+01	µg/L	1.3E-05	mg/kg/day	9.1E-02	1/(mg/kg/day)	1.2E-06	NA	NA	NA	NA	NA
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	9.9E-05	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Acetone	6.7E+03	µg/L	3.8E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	3.5E+01	µg/L	6.5E-05	mg/kg/day	5.5E-02	1/(mg/kg/day)	3.6E-06	NA	NA	NA	NA	NA
				Chloroethane	3.2E+02	µg/L	2.2E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	3.5E-01	µg/L	3.8E-07	mg/kg/day	3.1E-02	1/(mg/kg/day)	1.2E-08	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	1.8E+03	µg/L	2.8E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	3.9E+01	µg/L	2.8E-04	mg/kg/day	1.1E-02	1/(mg/kg/day)	3.1E-06	NA	NA	NA	NA	NA
				Methyl ethyl ketone	5.1E+03	µg/L	5.9E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Methyl isobutyl ketone	1.7E+03	µg/L	7.6E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	7.2E-05	mg/kg/day	2.0E-03	1/(mg/kg/day)	4.4E-07	NA	NA	NA	NA	NA
				Naphthalene	1.0E+01	µg/L	7.9E-05	mg/kg/day	1.2E-01	1/(mg/kg/day)	9.4E-06	NA	NA	NA	NA	NA
				Tetrachloroethene	5.7E+01	µg/L	4.1E-04	mg/kg/day	2.1E-03	1/(mg/kg/day)	8.5E-07	NA	NA	NA	NA	NA
				Toluene	1.0E+03	µg/L	4.3E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	2.7E+01	µg/L	5.4E-05	mg/kg/day	4.6E-02	1/(mg/kg/day)	1.7E-04	NA	NA	NA	NA	NA
				Vinyl chloride	5.1E+02	µg/L	4.8E-04	mg/kg/day	1.5E+00	1/(mg/kg/day)	4.6E-04	NA	NA	NA	NA	NA
				Xylene, m,p-	1.6E+02	µg/L	1.2E-03	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
				Xylene, o-	5.8E+01	µg/L	4.2E-04	mg/kg/day	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								6.9E-04					NA
		Exposure Point Total									8.7E-03					NA
	Exposure Medium Total										8.7E-03					NA

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Household Air	Vapors in House	Inhalation	1,1,1-Trichloroethane	1.6E+03	µg/L	2.8E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
(cont.)	(Domestic Use)	(Domestic Use)		1,1,2-Trichloroethane	1.2E+00	µg/L	2.1E-04	mg/m^3	1.6E-05	1/(µg/m3)	3.3E-06	NA	NA	NA	NA	NA
				1,1-Dichloroethane	3.4E+03	µg/L	6.0E-01	mg/m^3	1.6E-06	1/(µg/m3)	9.6E-04	NA	NA	NA	NA	NA
				1,1-Dichloroethene	1.0E+02	µg/L	1.8E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,2,4-Trimethylbenzene	3.3E+01	µg/L	6.0E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				1,2-Dichloroethane	2.3E+01	µg/L	4.1E-03	mg/m^3	2.6E-05	1/(µg/m3)	1.1E-04	NA	NA	NA	NA	NA
				1,3,5-Trimethylbenzene	1.0E+01	µg/L	1.8E-03	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Acetone	6.7E+03	µg/L	1.2E+00	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Benzene	3.5E+01	µg/L	6.3E-03	mg/m^3	7.8E-06	1/(µg/m3)	4.9E-05	NA	NA	NA	NA	NA
				Chloroethane	3.2E+02	µg/L	5.7E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Chloroform	3.5E-01	µg/L	6.2E-05	mg/m^3	2.3E-05	1/(µg/m3)	1.4E-06	NA	NA	NA	NA	NA
				cis-1,2-Dichloroethene	1.8E+03	µg/L	3.3E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Ethylbenzene	3.9E+01	µg/L	6.9E-03	mg/m^3	2.5E-06	1/(µg/m3)	1.7E-05	NA	NA	NA	NA	NA
				Methyl ethyl ketone	5.1E+03	µg/L	9.1E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Methyl isobutyl ketone	1.7E+03	µg/L	3.0E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Methylene chloride	1.6E+02	µg/L	2.8E-02	mg/m^3	1.0E-08	1/(µg/m3)	7.9E-07	NA	NA	NA	NA	NA
				Naphthalene	1.0E+01	µg/L	1.8E-03	mg/m^3	3.4E-05	1/(µg/m3)	6.1E-05	NA	NA	NA	NA	NA
				Tetrachloroethene	5.7E+01	µg/L	1.0E-02	mg/m^3	2.6E-07	1/(µg/m3)	2.6E-06	NA	NA	NA	NA	NA
				Toluene	1.0E+03	µg/L	1.8E-01	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Trichloroethene	2.7E+01	µg/L	4.8E-03	mg/m^3	4.1E-06	1/(µg/m3)	2.8E-05	NA	NA	NA	NA	NA
				Vinyl chloride	3.6E+02	µg/L	6.3E-02	mg/m^3	8.8E-06	1/(µg/m3)	4.9E-04	NA	NA	NA	NA	NA
				Xylene, m,p-	1.6E+02	µg/L	2.8E-02	mg/m^3	NA	NA	NA	NA	NA	NA	NA	NA
				Xylene, o-	5.8E+01	µg/L	1.0E-02	mg/m^{25}	NA	NA	NA	NA	NA	NA	NA	NA
			Exp. Route Total								1.7E-03					NA
		Exposure Point Total									1.7E-03					NA
	Exposure Medium Total										1.7E-03					NA
Groundwater Total											1.2E-02					NA
Receptor Total											1E-02					NA

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	

Notes:
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
NA = Not applicable/Not available
RfC = Reference concentration
RfD = Reference dose
µg/L = microgram per liter
µg/m^3= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.8.RME SUPPLEMENT A

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS (CHEMICALS WITH MUTAGENIC MODE OF ACTION)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake Value 0-2 yrs	Intake Value 2-6 yrs	Intake Value 6-16 yrs	Intake Value 16-26 yrs	Intake Value 0-6 yrs	Intake Value 6-26 yrs	Intake Units	CSF/Unit Risk Value 0-2 yrs (ADAF=10)	CSF/Unit Risk Value 2-6 yrs (ADAF=3)	CSF/Unit Risk Value 6-16 yrs (ADAF=3)	CSF/Unit Risk Value 16-26 yrs (ADAF=1)	CSF/Unit Risk Value 0-6 yrs (1)	CSF/Unit Risk Value 6-26 yrs (2)	CSF/Unit Risk Units	Cancer Risk
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	Inhalation	Trichloroethene	1.9E-02	mg/m^3	5.2E-04	1.0E-03	2.6E-03	2.6E-03	NA	NA	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	NA	NA	$1/(\mu g/m^3)$	2E-05
				Vinyl Chloride	4.3E-01	mg/m^3	NA	NA	NA	NA	3.6E-02	1.2E-01	mg/m^3	NA	NA	NA	NA	8.8E-06	4.4E-06	$1/(\mu g/m^3)$	8E-04
	Groundwater	Tapwater	Ingestion	Methylene chloride	1.6E+02	ug/L	2.3E-04	4.6E-04	6.8E-04	6.8E-04	NA	NA	mg/kg-day	2.0E-02	6.0E-03	6.0E-03	2.0E-03	NA	NA	1/(mg/kg-day)	1E-05
				Trichloroethene	2.7E+01	ug/L	3.9E-05	7.7E-05	1.2E-04	1.2E-04	NA	NA	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	NA	NA	1/(mg/kg-day)	1E-05
				Vinyl chloride	5.1E+02	ug/L	NA	NA	NA	NA	2.2E-03	4.4E-03	mg/kg-day	NA	NA	NA	NA	1.5E+00	7.2E-01	1/(mg/kg-day)	6E-03
			Dermal	Methylene chloride	1.6E+02	ug/L	7.5E-06	1.5E-05	2.5E-05	2.5E-05	NA	NA	mg/kg-day	2.0E-02	6.0E-03	6.0E-03	2.0E-03	NA	NA	1/(mg/kg-day)	4E-07
				Trichloroethene	2.7E+01	ug/L	5.6E-06	1.1E-05	1.9E-05	1.9E-05	NA	NA	mg/kg-day	9.3E-02	2.8E-02	2.8E-02	9.3E-03	NA	NA	1/(mg/kg-day)	2E-06
				Vinyl chloride	5.1E+02	ug/L	NA	NA	NA	NA	1.5E-04	3.4E-04	mg/kg-day	NA	NA	NA	NA	1.5E+00	7.2E-01	1/(mg/kg-day)	5E-04
	Household Air (Domestic Use)	Vapors in House (Domestic Use)	Inhalation	Methylene chloride	1.6E+02	ug/L	2.2E-03	4.4E-03	1.1E-02	1.1E-02	NA	NA	mg/m^3	1.0E-07	3.0E-08	3.0E-08	1.0E-08	NA	NA	$1/(\mu g/m^3)$	8E-07
				Trichloroethene	2.7E+01	ug/L	3.7E-04	7.4E-04	1.9E-03	1.9E-03	NA	NA	mg/m^3	1.0E-05	3.0E-06	3.0E-06	1.0E-06	NA	NA	$1/(\mu g/m^3)$	1E-05
				Vinyl chloride	5.1E+02	ug/L	NA	NA	NA	NA	2.1E-02	7.0E-02	mg/m^3	NA	NA	NA	NA	8.8E-06	4.4E-06	$1/(\mu g/m^3)$	5E-04

Notes:
(1) Continuous lifetime exposure to vinyl chloride from birth.
(2) Continuous lifetime exposure to vinyl chloride during adulthood.
ADAF = Age-dependent adjustment factor
bgs = below ground surface
CSF = Cancer slope factor
EPC = Exposure point concentration
$\mu g/m^3$= microgram per cubic meter
mg/m^3= milligram per cubic meter
mg/kg = milligram per kilogram
mg/kg/day = milligram per kilogram per day

TABLE 7.8.RME SUPPLEMENT B

CALCULATION OF CHEMICAL CANCER RISKS FOR TRICHLOROETHENE

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk
							Value	Units	Value	Units	(1)
Groundwater	Indoor Air	Indoor Air	Inhalation	Trichloroethene (Kidney)	1.9E-02	mg/m^3	(2)	mg/m^3	1.0E-06	1/(µg/m3)	2E-05
				Trichloroethene (NHL + Liver)	1.9E-02	mg/m^3	6.8E-03	mg/m^3	3.1E-06	1/(µg/m3)	2E-05
			Exp. Route Total								4E-05
	Tapwater	Tapwater	Ingestion	Trichloroethene (Kidney)	2.7E+01	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	1E-05
				Trichloroethene (NHL + Liver)	2.7E+01	µg/L	3.5E-04	mg/kg/day	3.7E-02	1/(mg/kg/day)	1E-05
			Exp. Route Total								2E-05
			Dermal	Trichloroethene (Kidney)	2.7E+01	µg/L	(2)	mg/kg/day	9.3E-03	1/(mg/kg/day)	2E-06
				Trichloroethene (NHL + Liver)	2.7E+01	µg/L	4.6E-03	mg/kg/day	3.7E-02	1/(mg/kg/day)	2E-04
			Exp. Route Total								2E-04
	Household Air	Household Air	Inhalation	Trichloroethene (Kidney)	2.7E+01	µg/L	(2)	mg/m^3	1.0E-06	1/(µg/m3)	1E-05
				Trichloroethene (NHL + Liver)	2.7E+01	µg/L	4.8E-03	mg/m^3	3.1E-06	1/(µg/m3)	1E-05
			Exp. Route Total								3E-05

Notes:

(1) Carcinogenic risks were estimated for trichloroethene by summing the risks for two different approaches: 1) Using the oral CSF factor for kidney cancer, which has a mutagenic mode of action (calculated in Table 7.7 RME Supplement A), and 2) using the CSF for non-Hodgkin lymphoma (NHL) and liver cancer.

(2) Intakes and exposure concentrations using the toxicity values for the kidney component of TCE were estimated on Table 7.7 RME Supplement A.

CSF = Cancer slope factor

µg/L = microgram per liter

mg/m^3= milligram per cubic meter

mg/kg/day = milligram per kilogram per day

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	2E-01	NA	2E-01
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	9E-01	NA	9E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			Benzene	NA	NA	NA	NA	Immune	NA	4E-01	NA	4E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	5E+00	NA	5E+00
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	2E-02	NA	2E-02
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	5E-01	NA	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	9E+00	NA	9E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	4E+00	NA	4E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E+01	NA	2E+01

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	4E-01	NA	2E-02	4E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	1E+00	NA	6E-02	1E+00
			RDX	NA	NA	NA	NA	Nervous	4E-02	NA	3E-04	4E-02
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	6E+00	NA	3E-02	6E+00
			Barium	NA	NA	NA	NA	Urinary	3E-01	NA	2E-02	3E-01
			1,1,1-Trichloroethane	NA	NA	NA	NA	Body Weight	2E-02	NA	4E-03	3E-02
			1,1,2-Trichloroethane	NA	NA	NA	NA	Immune, Hematologic	9E-03	NA	6E-04	9E-03
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	7E-01	NA	6E-02	8E-01
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	6E-02	NA	8E-03	7E-02
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	1E-01	NA	1E-01	2E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Urinary	1E-01	NA	5E-03	1E-01
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	3E-02	NA	2E-02	5E-02
			Acetone	NA	NA	NA	NA	Urinary	2E-01	NA	1E-03	2E-01
			Benzene	NA	NA	NA	NA	Immune	3E-01	NA	4E-02	3E-01
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	NA	NA	NA	Hepatic	1E-03	NA	9E-05	1E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	3E+01	NA	3E+00	3E+01
			Ethylbenzene	NA	NA	NA	NA	Hepatic, Urinary	1E-02	NA	7E-03	2E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental	3E-01	NA	2E-03	3E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	NA	NA	NA	NA	Hepatic	8E-01	NA	3E-02	8E-01
			Naphthalene	NA	NA	NA	NA	Whole body	1E-02	NA	9E-03	2E-02
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	3E-01	NA	2E-01	4E-01
			Toluene	NA	NA	NA	NA	Urinary	4E-01	NA	1E-01	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	2E+00	NA	3E-01	2E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	5E+00	NA	4E-01	5E+00
			Xylene, m,p-	NA	NA	NA	NA	Body Weight, Longevity	2E-02	NA	1E-02	4E-02
			Xylene, o-	NA	NA	NA	NA	Body Weight, Longevity	9E-03	NA	5E-03	1E-02
		Exposure Point Total		NA	NA	NA	NA		5E+01	NA	5E+00	5E+01
	Exposure Medium Total			NA	NA	NA	NA		5E+01	NA	5E+00	5E+01

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	3E+00	NA	3E+00
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	2E+00	NA	2E+00
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	8E-02	NA	8E-02
			Acetone	NA	NA	NA	NA	Nervous	NA	1E-01	NA	1E-01
			Benzene	NA	NA	NA	NA	Immune	NA	6E-01	NA	6E-01
			Chloroethane	NA	NA	NA	NA	Reproductive	NA	4E-02	NA	4E-02
			Chloroform	NA	NA	NA	NA	Hepatic	NA	2E-03	NA	2E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	2E+01	NA	2E+01
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	2E-02	NA	2E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	5E-01	NA	5E-01
			Methylene chloride	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	2E+00	NA	2E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	7E-01	NA	7E-01
			Toluene	NA	NA	NA	NA	Nervous	NA	1E-01	NA	1E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	2E+00	NA	2E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	4E+01	NA	4E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	4E+01	NA	4E+01
Groundwater Total				NA	NA	NA	NA		5E+01	6E+01	5E+00	1E+02
Receptor Total				NA	NA	NA	NA		5E+01	6E+01	5E+00	1E+02

TABLE 9.1.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Body Weight HI Across Media =	0.08
Total Cardiovascular HI Across Media =	**23**
Total Dermal HI Across Media =	**6**
Total Developmental HI Across Media =	**18**
Total Hematologic HI Across Media =	0.009
Total Hepatic HI Across Media =	**16**
Total Immune HI Across Media =	**46**
Total Longevity HI Across Media =	0.05
Total Musculoskeletal HI Across Media =	0.5
Total Nervous HI Across Media =	**8**
Total Ocular HI Across Media =	**2**
Total Reproductive HI Across Media =	0.04
Total Respiratory HI Across Media =	**5**
Total Whole body HI Across Media =	0.02

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	2E-01	NA	2E-01
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	9E-01	NA	9E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			Benzene	NA	NA	NA	NA	Immune	NA	4E-01	NA	4E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	5E+00	NA	5E+00
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	2E-02	NA	2E-02
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	5E-01	NA	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	9E+00	NA	9E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	4E+00	NA	4E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E+01	NA	2E+01

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	6E-01	NA	2E-02	6E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	2E+00	NA	9E-02	2E+00
			RDX	NA	NA	NA	NA	Nervous	6E-02	NA	5E-04	6E-02
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	9E+00	NA	4E-02	9E+00
			Barium	NA	NA	NA	NA	Urinary	5E-01	NA	3E-02	5E-01
			1,1,1-Trichloroethane	NA	NA	NA	NA	Body Weight	4E-02	NA	6E-03	5E-02
			1,1,2-Trichloroethane	NA	NA	NA	NA	Immune, Hematologic	1E-02	NA	9E-04	2E-02
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	1E+00	NA	8E-02	1E+00
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	1E-01	NA	1E-02	1E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	2E-01	NA	2E-01	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Urinary	2E-01	NA	8E-03	2E-01
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	5E-02	NA	4E-02	9E-02
			Acetone	NA	NA	NA	NA	Urinary	4E-01	NA	2E-03	4E-01
			Benzene	NA	NA	NA	NA	Immune	4E-01	NA	6E-02	5E-01
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	NA	NA	NA	Hepatic	2E-03	NA	1E-04	2E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	5E+01	NA	5E+00	5E+01
			Ethylbenzene	NA	NA	NA	NA	Hepatic, Urinary	2E-02	NA	1E-02	3E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental	4E-01	NA	3E-03	4E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	NA	NA	NA	NA	Hepatic	1E+00	NA	4E-02	1E+00
			Naphthalene	NA	NA	NA	NA	Whole body	2E-02	NA	1E-02	4E-02
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	5E-01	NA	2E-01	7E-01
			Toluene	NA	NA	NA	NA	Urinary	6E-01	NA	2E-01	8E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	3E+00	NA	4E-01	3E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	8E+00	NA	6E-01	9E+00
			Xylene, m,p-	NA	NA	NA	NA	Body Weight, Longevity	4E-02	NA	2E-02	6E-02
			Xylene, o-	NA	NA	NA	NA	Body Weight, Longevity	1E-02	NA	8E-03	2E-02
		Exposure Point Total		NA	NA	NA	NA		8E+01	NA	7E+00	8E+01
	Exposure Medium Total			NA	NA	NA	NA		8E+01	NA	7E+00	8E+01

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	3E+00	NA	3E+00
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	2E+00	NA	2E+00
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	8E-02	NA	8E-02
			Acetone	NA	NA	NA	NA	Nervous	NA	1E-01	NA	1E-01
			Benzene	NA	NA	NA	NA	Immune	NA	6E-01	NA	6E-01
			Chloroethane	NA	NA	NA	NA	Reproductive	NA	4E-02	NA	4E-02
			Chloroform	NA	NA	NA	NA	Hepatic	NA	2E-03	NA	2E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	2E+01	NA	2E+01
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	2E-02	NA	2E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	5E-01	NA	5E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	3E-01	NA	3E-01
			Methylene chloride	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	2E+00	NA	2E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	7E-01	NA	7E-01
			Toluene	NA	NA	NA	NA	Nervous	NA	1E-01	NA	1E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	2E+00	NA	2E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	4E+01	NA	4E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	4E+01	NA	4E+01
Groundwater Total				NA	NA	NA	NA		8E+01	6E+01	7E+00	1E+02
Receptor Total				NA	NA	NA	NA		8E+01	6E+01	7E+00	1E+02

TABLE 9.2.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Body Weight HI Across Media =	0.1
Total Cardiovascular HI Across Media =	**28**
Total Dermal HI Across Media =	**9**
Total Developmental HI Across Media =	**20**
Total Hematologic HI Across Media =	0.02
Total Hepatic HI Across Media =	**21**
Total Immune HI Across Media =	**47**
Total Longevity HI Across Media =	0.08
Total Musculoskeletal HI Across Media =	0.8
Total Nervous HI Across Media =	**9**
Total Ocular HI Across Media =	**2**
Total Reproductive HI Across Media =	0.04
Total Respiratory HI Across Media =	**5**
Total Whole body HI Across Media =	0.04

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1,2-Trichloroethane	NA	3E-07	NA	3E-07	NA	NA	NA	NA	NA
			1,1-Dichloroethane	NA	4E-04	NA	4E-04	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2-Dichloroethane	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Benzene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	NA	2E-06	NA	2E-06	NA	NA	NA	NA	NA
			Trichloroethene	NA	4E-05	NA	4E-05	NA	NA	NA	NA	NA
			Vinyl chloride	NA	8E-04	NA	8E-04	NA	NA	NA	NA	NA
			Xylene, m,p-	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Xylene, o-	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		NA	1E-03	NA	1E-03		NA	NA	NA	NA
	Exposure Medium Total			NA	1E-03	NA	1E-03		NA	NA	NA	NA

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			RDX	5E-06	NA	4E-08	5E-06	NA	NA	NA	NA	NA
			Arsenic	1E-03	NA	6E-06	1E-03	NA	NA	NA	NA	NA
			Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1,2-Trichloroethane	9E-07	NA	6E-08	9E-07	NA	NA	NA	NA	NA
			1,1-Dichloroethane	4E-04	NA	3E-05	4E-04	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2-Dichloroethane	3E-05	NA	1E-06	3E-05	NA	NA	NA	NA	NA
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	2E-05	NA	4E-06	3E-05	NA	NA	NA	NA	NA
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	1E-07	NA	1E-08	2E-07	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	5E-06	NA	3E-06	8E-06	NA	NA	NA	NA	NA
			Methyl ethyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	1E-05	NA	4E-07	1E-05	NA	NA	NA	NA	NA
			Naphthalene	2E-05	NA	9E-06	2E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	2E-06	NA	9E-07	2E-06	NA	NA	NA	NA	NA
			Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Trichloroethene	2E-05	NA	2E-04	2E-04	NA	NA	NA	NA	NA
			Vinyl chloride	6E-03	NA	5E-04	7E-03	NA	NA	NA	NA	NA
			Xylene, m,p-	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Xylene, o-	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		8E-03	NA	7E-04	9E-03		NA	NA	NA	NA
	Exposure Medium Total			8E-03	NA	7E-04	9E-03		NA	NA	NA	NA

TABLE 9.3.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (NATURALLY OCCURRING CHEMICALS AND SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1,2-Trichloroethane	NA	3E-06	NA	3E-06	NA	NA	NA	NA	NA
			1,1-Dichloroethane	NA	1E-03	NA	1E-03	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2-Dichloroethane	NA	1E-04	NA	1E-04	NA	NA	NA	NA	NA
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	NA	5E-05	NA	5E-05	NA	NA	NA	NA	NA
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	1E-06	NA	1E-06	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Methyl ethyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	NA	8E-07	NA	8E-07	NA	NA	NA	NA	NA
			Naphthalene	NA	6E-05	NA	6E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	NA	3E-06	NA	3E-06	NA	NA	NA	NA	NA
			Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Trichloroethene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
			Vinyl chloride	NA	5E-04	NA	5E-04	NA	NA	NA	NA	NA
			Xylene, m,p-	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Xylene, o-	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		NA	2E-03	NA	2E-03		NA	NA	NA	NA
	Exposure Medium Total			NA	2E-03	NA	2E-03		NA	NA	NA	NA
Groundwater Total				8E-03	3E-03	7E-04	1E-02		NA	NA	NA	NA
Receptor Total				8E-03	3E-03	7E-04	1E-02		NA	NA	NA	NA

Notes: NA = Not applicable or not available

TABLE 9.4.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	4E-02	NA	4E-02
			1,1,2-Trichloroethane	NA	6E-08	NA	6E-08	Respiratory	NA	5E-02	NA	5E-02
			1,1-Dichloroethane	NA	9E-05	NA	9E-05	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	5E-02	NA	5E-02
			1,2-Dichloroethane	NA	5E-06	NA	5E-06	Nervous	NA	7E-02	NA	7E-02
			Benzene	NA	7E-06	NA	7E-06	Immune	NA	9E-02	NA	9E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	1E+00	NA	1E+00
			Ethylbenzene	NA	4E-06	NA	4E-06	Developmental	NA	5E-03	NA	5E-03
			Tetrachloroethene	NA	5E-07	NA	5E-07	Nervous, Ocular	NA	1E-01	NA	1E-01
			Trichloroethene	NA	6E-06	NA	6E-06	Developmental, Cardiovascular, Immune	NA	2E+00	NA	2E+00
			Vinyl chloride	NA	3E-04	NA	3E-04	Hepatic	NA	1E+00	NA	1E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	4E-04	NA	4E-04		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	4E-04	NA	4E-04		NA	5E+00	NA	5E+00

TABLE 9.4.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	1E-01	NA	7E-04	1E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	4E-01	NA	3E-03	4E-01
			RDX	1E-06	NA	2E-09	1E-06	Nervous	1E-02	NA	2E-05	1E-02
			Arsenic	3E-04	NA	1E-07	3E-04	Cardiovascular, Dermal	2E+00	NA	8E-04	2E+00
			Barium	NA	NA	NA	NA	Urinary	9E-02	NA	6E-04	9E-02
			1,1,1-Trichloroethane	NA	NA	NA	NA	Body Weight	7E-03	NA	2E-04	7E-03
			1,1,2-Trichloroethane	2E-07	NA	2E-09	2E-07	Immune, Hematologic	2E-03	NA	3E-05	3E-03
			1,1-Dichloroethane	9E-05	NA	1E-06	9E-05	Urinary	2E-01	NA	3E-03	2E-01
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	2E-02	NA	4E-04	2E-02
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	3E-02	NA	5E-03	3E-02
			1,2-Dichloroethane	6E-06	NA	5E-08	6E-06	Urinary	3E-02	NA	3E-04	3E-02
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	9E-03	NA	1E-03	1E-02
			Acetone	NA	NA	NA	NA	Urinary	6E-02	NA	5E-05	6E-02
			Benzene	6E-06	NA	1E-07	6E-06	Immune	8E-02	NA	2E-03	8E-02
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	3E-08	NA	5E-10	3E-08	Hepatic	3E-04	NA	4E-06	3E-04
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	8E+00	NA	2E-01	8E+00
			Ethylbenzene	1E-06	NA	1E-07	1E-06	Hepatic, Urinary	3E-03	NA	3E-04	4E-03
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental	7E-02	NA	1E-04	7E-02
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	1E-06	NA	6E-09	1E-06	Hepatic	2E-01	NA	1E-03	2E-01
			Naphthalene	4E-06	NA	4E-07	4E-06	Whole body	4E-03	NA	5E-04	5E-03
			Tetrachloroethene	4E-07	NA	4E-08	4E-07	Nervous, Ocular	8E-02	NA	8E-03	9E-02
			Toluene	NA	NA	NA	NA	Urinary	1E-01	NA	6E-03	1E-01
			Trichloroethene	4E-06	NA	1E-07	4E-06	Developmental, Cardiovascular, Immune	5E-01	NA	1E-02	5E-01
			Vinyl chloride	2E-03	NA	3E-05	2E-03	Hepatic	1E+00	NA	2E-02	1E+00
			Xylene, m,p-	NA	NA	NA	NA	Body Weight, Longevity	7E-03	NA	7E-04	8E-03
			Xylene, o-	NA	NA	NA	NA	Body Weight, Longevity	9E-03	NA	3E-03	1E-02

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
		Exposure Point Total		3E-03	NA	3E-05	3E-03		1E+01	NA	2E-01	1E+01
	Exposure Medium Total			3E-03	NA	3E-05	3E-03		1E+01	NA	2E-01	1E+01
Groundwater Total				3E-03	4E-04	3E-05	3E-03		1E+01	5E+00	2E-01	2E+01
Receptor Total				3E-03	4E-04	3E-05	3E-03		1E+01	5E+00	2E-01	2E+01

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Body Weight HI Across Media =	0.03
Total Cardiovascular HI Across Media =	**4**
Total Dermal HI Across Media =	**2**
Total Developmental HI Across Media =	**3**
Total Hematologic HI Across Media =	0.003
Total Hepatic HI Across Media =	**3**
Total Immune HI Across Media =	**4**
Total Longevity HI Across Media =	0.02
Total Nervous HI Across Media =	0.8
Total Ocular HI Across Media =	0.2
Total Respiratory HI Across Media =	0.05
Total Urinary HI Across Media =	**9**
Total Whole body HI Across Media =	0.005

TABLE 9.5.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Shallow Groundwater	Shallow Groundwater	Shallow Groundwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	4E-04	NA	2E-03	2E-03
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	1E-03	NA	6E-03	8E-03
			RDX	2E-11	NA	2E-11	3E-11	Nervous	5E-06	NA	4E-06	9E-06
			Arsenic	4E-09	NA	3E-09	6E-09	Cardiovascular, Dermal	2E-02	NA	1E-02	3E-02
			Barium	NA	NA	NA	NA	Urinary	1E-03	NA	9E-03	1E-02
			Naphthalene	5E-11	NA	3E-09	4E-09	Whole body	2E-06	NA	1E-04	1E-04
			1,1,1-Trichloroethane	NA	NA	NA	NA	Body Weight	3E-05	NA	5E-04	5E-04
			1,1,2-Trichloroethane	2E-12	NA	1E-11	1E-11	Immune, Hematologic	2E-05	NA	1E-04	1E-04
			1,1-Dichloroethane	1E-09	NA	1E-08	1E-08	Urinary	2E-04	NA	2E-03	2E-03
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	1E-03	NA	2E-02	2E-02
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	2E-04	NA	2E-02	2E-02
			1,2-Dichloroethane	1E-10	NA	7E-10	8E-10	Urinary	2E-04	NA	8E-04	9E-04
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	4E-05	NA	3E-03	3E-03
			Acetone	NA	NA	NA	NA	Urinary	1E-03	NA	5E-04	2E-03
			Benzene	2E-10	NA	3E-09	3E-09	Immune	8E-04	NA	1E-02	1E-02
			Chloroethane	NA	NA	NA	NA	NA	7E-04	NA	4E-02	4E-02
			Chloroform	5E-13	NA	4E-12	5E-12	Hepatic	3E-07	NA	3E-06	3E-06
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	1E-02	NA	1E-01	1E-01
			Ethylbenzene	3E-11	NA	2E-09	2E-09	Hepatic, Urinary	1E-04	NA	8E-03	8E-03
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental	2E-04	NA	2E-04	5E-04
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	2E-04	NA	8E-04	1E-03
			Methylene chloride	1E-11	NA	6E-11	7E-11	Hepatic	3E-04	NA	1E-03	1E-03
			Tetrachloroethene	2E-12	NA	1E-10	1E-10	Nervous, Ocular	3E-04	NA	2E-02	2E-02
			Toluene	NA	NA	NA	NA	Urinary	2E-04	NA	8E-03	8E-03
			Trichloroethene	2E-10	NA	3E-09	3E-09	Developmental, Cardiovascular, Immune	2E-02	NA	3E-01	3E-01
			Vinyl chloride	1E-08	NA	1E-07	1E-07	Hepatic	6E-03	NA	5E-02	5E-02
			Xylene, m,p-	NA	NA	NA	NA	Body Weight, Longevity	6E-05	NA	4E-03	4E-03
			Xylene, o-	NA	NA	NA	NA	Body Weight, Longevity	2E-05	NA	1E-03	1E-03
		Exposure Point Total		2E-08	NA	1E-07	1E-07		6E-02	NA	6E-01	6E-01
	Exposure Medium Total			2E-08	NA	1E-07	1E-07		6E-02	NA	6E-01	6E-01

TABLE 9.5.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Trench Air	Vapors in a Trench	Naphthalene	NA	3E-08	NA	3E-08	Nervous, Respiratory	NA	6E-01	NA	6E-01
			1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	8E-02	NA	8E-02
			1,1,2-Trichloroethane	NA	9E-10	NA	9E-10	Respiratory	NA	1E-02	NA	1E-02
			1,1-Dichloroethane	NA	9E-07	NA	9E-07	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	7E-02	NA	7E-02
			1,2-Dichloroethane	NA	9E-08	NA	9E-08	Nervous	NA	1E-01	NA	1E-01
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	2E-02	NA	2E-02
			Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	NA	8E-08	NA	8E-08	Immune	NA	3E-01	NA	3E-01
			Chloroethane	NA	NA	NA	NA	Reproductive	NA	5E-02	NA	5E-02
			Chloroform	NA	8E-10	NA	8E-10	Hepatic	NA	3E-04	NA	3E-04
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	3E+01	NA	3E+01
			Ethylbenzene	NA	4E-07	NA	4E-07	Developmental	NA	4E-02	NA	4E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	2E+01	NA	2E+01
			Methyl isobutyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	8E+00	NA	8E+00
			Methylene chloride	NA	5E-09	NA	5E-09	Hepatic	NA	9E-01	NA	9E-01
			Tetrachloroethene	NA	1E-08	NA	1E-08	Nervous, Ocular	NA	3E+00	NA	3E+00
			Toluene	NA	NA	NA	NA	Nervous	NA	2E+00	NA	2E+00
			Trichloroethene	NA	8E-07	NA	8E-07	Developmental, Cardiovascular, Immune	NA	2E+02	NA	2E+02
			Vinyl chloride	NA	5E-06	NA	5E-06	Hepatic	NA	2E+01	NA	2E+01
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	4E+00	NA	4E+00
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	1E+00	NA	1E+00
		Exposure Point Total		NA	8E-06	NA	8E-06		NA	3E+02	NA	3E+02
	Exposure Medium Total			NA	8E-06	NA	8E-06		NA	3E+02	NA	3E+02
Groundwater Total				2E-08	8E-06	1E-07	8E-06		6E-02	3E+02	6E-01	3E+02
Receptor Total				2E-08	8E-06	1E-07	8E-06		6E-02	3E+02	6E-01	3E+02

TABLE 9.5.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Body Weight HI Across Media =	0.006
Total Cardiovascular HI Across Media =	**202**
Total Dermal HI Across Media =	0.03
Total Developmental HI Across Media =	**227**
Total Hematologic HI Across Media =	0.0001
Total Hepatic HI Across Media =	**18**
Total Immune HI Across Media =	**230**
Total Longevity HI Across Media =	0.005
Total Musculoskeletal HI Across Media =	**25**
Total Nervous HI Across Media =	**11**
Total Ocular HI Across Media =	**3**
Total Reproductive HI Across Media =	0.05
Total Respiratory HI Across Media =	0.6
Total Urinary HI Across Media =	0.2
Total Whole body HI Across Media =	0.0001

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	2E-01	NA	2E-01
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	9E-01	NA	9E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			Benzene	NA	NA	NA	NA	Immune	NA	4E-01	NA	4E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	5E+00	NA	5E+00
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	2E-02	NA	2E-02
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	5E-01	NA	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	9E+00	NA	9E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	4E+00	NA	4E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E+01	NA	2E+01

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	4E-01	NA	2E-02	4E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	1E+00	NA	6E-02	1E+00
			RDX	NA	NA	NA	NA	Nervous	4E-02	NA	3E-04	4E-02
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	6E+00	NA	3E-02	6E+00
			Barium	NA	NA	NA	NA	Urinary	3E-01	NA	2E-02	3E-01
			1,1,1-Trichloroethane	NA	NA	NA	NA	Body Weight	2E-02	NA	4E-03	3E-02
			1,1,2-Trichloroethane	NA	NA	NA	NA	Immune, Hematologic	9E-03	NA	6E-04	9E-03
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	7E-01	NA	6E-02	8E-01
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	6E-02	NA	8E-03	7E-02
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	1E-01	NA	1E-01	2E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Urinary	1E-01	NA	5E-03	1E-01
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	3E-02	NA	2E-02	5E-02
			Acetone	NA	NA	NA	NA	Urinary	2E-01	NA	1E-03	2E-01
			Benzene	NA	NA	NA	NA	Immune	3E-01	NA	4E-02	3E-01
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	NA	NA	NA	Hepatic	1E-03	NA	9E-05	1E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	3E+01	NA	3E+00	3E+01
			Ethylbenzene	NA	NA	NA	NA	Hepatic, Urinary	1E-02	NA	7E-03	2E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental	3E-01	NA	2E-03	3E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	NA	NA	NA	NA	Hepatic	8E-01	NA	3E-02	8E-01
			Naphthalene	NA	NA	NA	NA	Whole body	1E-02	NA	9E-03	2E-02
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	3E-01	NA	2E-01	4E-01
			Toluene	NA	NA	NA	NA	Urinary	4E-01	NA	1E-01	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	2E+00	NA	3E-01	2E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	5E+00	NA	4E-01	5E+00
			Xylene, m,p-	NA	NA	NA	NA	Body Weight, Longevity	2E-02	NA	1E-02	4E-02
			Xylene, o-	NA	NA	NA	NA	Body Weight, Longevity	9E-03	NA	5E-03	1E-02
		Exposure Point Total		NA	NA	NA	NA		5E+01	NA	5E+00	5E+01
	Exposure Medium Total			NA	NA	NA	NA		5E+01	NA	5E+00	5E+01

TABLE 9.6.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	3E+00	NA	3E+00
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	2E+00	NA	2E+00
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	8E-02	NA	8E-02
			Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	NA	NA	NA	NA	Immune	NA	6E-01	NA	6E-01
			Chloroethane	NA	NA	NA	NA	Reproductive	NA	4E-02	NA	4E-02
			Chloroform	NA	NA	NA	NA	Hepatic	NA	2E-03	NA	2E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	2E+01	NA	2E+01
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	2E-02	NA	2E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	5E-01	NA	5E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	3E-01	NA	3E-01
			Methylene chloride	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	2E+00	NA	2E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	7E-01	NA	7E-01
			Toluene	NA	NA	NA	NA	Nervous	NA	1E-01	NA	1E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	2E+00	NA	2E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	4E+01	NA	4E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	4E+01	NA	4E+01
Groundwater Total				NA	NA	NA	NA		5E+01	6E+01	5E+00	1E+02
Receptor Total				NA	NA	NA	NA		5E+01	6E+01	5E+00	1E+02

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Body Weight HI Across Media =	0.08
Total Cardiovascular HI Across Media =	**23**
Total Dermal HI Across Media =	**6**
Total Developmental HI Across Media =	**19**
Total Hematologic HI Across Media =	0.009
Total Hepatic HI Across Media =	**16**
Total Immune HI Across Media =	**46**
Total Longevity HI Across Media =	0.05
Total Musculoskeletal HI Across Media =	0.8
Total Nervous HI Across Media =	**8**
Total Ocular HI Across Media =	**2**
Total Reproductive HI Across Media =	0.04
Total Respiratory HI Across Media =	**5**
Total Urinary HI Across Media =	**33**
Total Whole body HI Across Media =	0.02

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	2E-01	NA	2E-01
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	9E-01	NA	9E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			Benzene	NA	NA	NA	NA	Immune	NA	4E-01	NA	4E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	5E+00	NA	5E+00
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	2E-02	NA	2E-02
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	5E-01	NA	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	9E+00	NA	9E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	4E+00	NA	4E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E+01	NA	2E+01

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	6E-01	NA	2E-02	6E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	2E+00	NA	9E-02	2E+00
			RDX	NA	NA	NA	NA	Nervous	6E-02	NA	5E-04	6E-02
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	9E+00	NA	4E-02	9E+00
			Barium	NA	NA	NA	NA	Urinary	5E-01	NA	3E-02	5E-01
			1,1,1-Trichloroethane	NA	NA	NA	NA	Body Weight	4E-02	NA	6E-03	5E-02
			1,1,2-Trichloroethane	NA	NA	NA	NA	Immune, Hematologic	1E-02	NA	9E-04	2E-02
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	1E+00	NA	8E-02	1E+00
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	1E-01	NA	1E-02	1E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	2E-01	NA	2E-01	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Urinary	2E-01	NA	8E-03	2E-01
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	5E-02	NA	4E-02	9E-02
			Acetone	NA	NA	NA	NA	Urinary	4E-01	NA	2E-03	4E-01
			Benzene	NA	NA	NA	NA	Immune	4E-01	NA	6E-02	5E-01
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	NA	NA	NA	Hepatic	2E-03	NA	1E-04	2E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	5E+01	NA	5E+00	5E+01
			Ethylbenzene	NA	NA	NA	NA	Hepatic, Urinary	2E-02	NA	1E-02	3E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental	4E-01	NA	3E-03	4E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	NA	NA	NA	NA	Hepatic	1E+00	NA	4E-02	1E+00
			Naphthalene	NA	NA	NA	NA	Whole body	2E-02	NA	1E-02	4E-02
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	5E-01	NA	2E-01	7E-01
			Toluene	NA	NA	NA	NA	Urinary	6E-01	NA	2E-01	8E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	3E+00	NA	4E-01	3E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	8E+00	NA	6E-01	9E+00
			Xylene, m,p-	NA	NA	NA	NA	Body Weight, Longevity	4E-02	NA	2E-02	6E-02
			Xylene, o-	NA	NA	NA	NA	Body Weight, Longevity	1E-02	NA	8E-03	2E-02
		Exposure Point Total		NA	NA	NA	NA		8E+01	NA	7E+00	8E+01
	Exposure Medium Total			NA	NA	NA	NA		8E+01	NA	7E+00	8E+01

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	3E+00	NA	3E+00
			1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	2E+00	NA	2E+00
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	8E-02	NA	8E-02
			Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	NA	NA	NA	NA	Immune	NA	6E-01	NA	6E-01
			Chloroethane	NA	NA	NA	NA	Reproductive	NA	4E-02	NA	4E-02
			Chloroform	NA	NA	NA	NA	Hepatic	NA	2E-03	NA	2E-03
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	2E+01	NA	2E+01
			Ethylbenzene	NA	NA	NA	NA	Developmental	NA	2E-02	NA	2E-02
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	5E-01	NA	5E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	3E-01	NA	3E-01
			Methylene chloride	NA	NA	NA	NA	Hepatic	NA	1E-01	NA	1E-01
			Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	2E+00	NA	2E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	7E-01	NA	7E-01
			Toluene	NA	NA	NA	NA	Nervous	NA	1E-01	NA	1E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	2E+00	NA	2E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	4E+01	NA	4E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	4E+01	NA	4E+01
Groundwater Total				NA	NA	NA	NA		8E+01	6E+01	7E+00	1E+02
Receptor Total				NA	NA	NA	NA		8E+01	6E+01	7E+00	1E+02

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Body Weight HI Across Media =	0.1
Total Cardiovascular HI Across Media =	**28**
Total Dermal HI Across Media =	**9**
Total Developmental HI Across Media =	**20**
Total Hematologic HI Across Media =	0.02
Total Hepatic HI Across Media =	**21**
Total Immune HI Across Media =	**47**
Total Longevity HI Across Media =	0.08
Total Musculoskeletal HI Across Media =	0.8
Total Nervous HI Across Media =	**9**
Total Ocular HI Across Media =	**2**
Total Reproductive HI Across Media =	0.04
Total Respiratory HI Across Media =	**5**
Total Urinary HI Across Media =	**54**
Total Whole body HI Across Media =	0.04

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1,2-Trichloroethane	NA	3E-07	NA	3E-07	NA	NA	NA	NA	NA
			1,1-Dichloroethane	NA	4E-04	NA	4E-04	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2-Dichloroethane	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Benzene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	NA	2E-06	NA	2E-06	NA	NA	NA	NA	NA
			Trichloroethene	NA	4E-05	NA	4E-05	NA	NA	NA	NA	NA
			Vinyl chloride	NA	8E-04	NA	8E-04	NA	NA	NA	NA	NA
			Xylene, m,p-	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Xylene, o-	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		NA	1E-03	NA	1E-03		NA	NA	NA	NA
	Exposure Medium Total			NA	1E-03	NA	1E-03		NA	NA	NA	NA

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			RDX	5E-06	NA	4E-08	5E-06	NA	NA	NA	NA	NA
			Arsenic	1E-03	NA	6E-06	1E-03	NA	NA	NA	NA	NA
			Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1,2-Trichloroethane	9E-07	NA	6E-08	9E-07	NA	NA	NA	NA	NA
			1,1-Dichloroethane	4E-04	NA	3E-05	4E-04	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2-Dichloroethane	3E-05	NA	1E-06	3E-05	NA	NA	NA	NA	NA
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	2E-05	NA	4E-06	3E-05	NA	NA	NA	NA	NA
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	1E-07	NA	1E-08	2E-07	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	5E-06	NA	3E-06	8E-06	NA	NA	NA	NA	NA
			Methyl ethyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	1E-05	NA	4E-07	1E-05	NA	NA	NA	NA	NA
			Naphthalene	2E-05	NA	9E-06	2E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	2E-06	NA	9E-07	2E-06	NA	NA	NA	NA	NA
			Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Trichloroethene	2E-05	NA	2E-04	2E-04	NA	NA	NA	NA	NA
			Vinyl chloride	6E-03	NA	5E-04	7E-03	NA	NA	NA	NA	NA
			Xylene, m,p-	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Xylene, o-	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		8E-03	NA	7E-04	9E-03		NA	NA	NA	NA
	Exposure Medium Total			8E-03	NA	7E-04	9E-03		NA	NA	NA	NA

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (SITE-RELATED COPCS)

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,1,2-Trichloroethane	NA	3E-06	NA	3E-06	NA	NA	NA	NA	NA
			1,1-Dichloroethane	NA	1E-03	NA	1E-03	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			1,2-Dichloroethane	NA	1E-04	NA	1E-04	NA	NA	NA	NA	NA
			1,3,5-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Benzene	NA	5E-05	NA	5E-05	NA	NA	NA	NA	NA
			Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Chloroform	NA	1E-06	NA	1E-06	NA	NA	NA	NA	NA
			cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Ethylbenzene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Methyl ethyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Methylene chloride	NA	8E-07	NA	8E-07	NA	NA	NA	NA	NA
			Naphthalene	NA	6E-05	NA	6E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	NA	3E-06	NA	3E-06	NA	NA	NA	NA	NA
			Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Trichloroethene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
			Vinyl chloride	NA	5E-04	NA	5E-04	NA	NA	NA	NA	NA
			Xylene, m,p-	NA	NA	NA	NA	NA	NA	NA	NA	NA
			Xylene, o-	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		NA	2E-03	NA	2E-03		NA	NA	NA	NA
	Exposure Medium Total			NA	2E-03	NA	2E-03		NA	NA	NA	NA
Groundwater Total				8E-03	3E-03	7E-04	1E-02		NA	NA	NA	NA
Receptor Total				8E-03	3E-03	7E-04	1E-02		NA	NA	NA	NA

Notes: NA = Not applicable or not available

TABLE 10.1.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1-Dichloroethane	NA	9E-05	NA	9E-05	NA	NA	NA	NA	NA
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,2-Dichloroethane	NA	5E-06	NA	5E-06	Nervous	NA	7E-02	NA	7E-02
			Benzene	NA	7E-06	NA	7E-06	Immune	NA	9E-02	NA	9E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	1E+00	NA	1E+00
			Ethylbenzene	NA	4E-06	NA	4E-06	Developmental	NA	5E-03	NA	5E-03
			Trichloroethene	NA	6E-06	NA	6E-06	Developmental, Cardiovascular, Immune	NA	2E+00	NA	2E+00
			Vinyl chloride	NA	3E-04	NA	3E-04	Hepatic	NA	1E+00	NA	1E+00
		Exposure Point Total		NA	4E-04	NA	4E-04		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	4E-04	NA	4E-04		NA	5E+00	NA	5E+00
Groundwater (cont.)	Tapwater	Tapwater	4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	4E-01	NA	3E-03	4E-01
			Arsenic	3E-04	NA	1E-07	3E-04	Cardiovascular, Dermal	2E+00	NA	8E-04	2E+00
			1,1-Dichloroethane	9E-05	NA	1E-06	9E-05	Urinary	2E-01	NA	3E-03	2E-01
			1,2-Dichloroethane	6E-06	NA	5E-08	6E-06	Urinary	3E-02	NA	3E-04	3E-02
			Benzene	6E-06	NA	1E-07	6E-06	Immune	8E-02	NA	2E-03	8E-02
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	8E+00	NA	2E-01	8E+00
			Methylene chloride	1E-06	NA	6E-09	1E-06	Hepatic	2E-01	NA	1E-03	2E-01
			Naphthalene	4E-06	NA	4E-07	4E-06	Whole body	4E-03	NA	5E-04	5E-03
			Trichloroethene	4E-06	NA	1E-07	4E-06	Developmental, Cardiovascular, Immune	5E-01	NA	1E-02	5E-01
			Vinyl chloride	2E-03	NA	3E-05	2E-03	Hepatic	1E+00	NA	2E-02	1E+00
		Exposure Point Total		3E-03	NA	3E-05	3E-03		1E+01	NA	2E-01	1E+01
	Exposure Medium Total			3E-03	NA	3E-05	3E-03		1E+01	NA	2E-01	1E+01
Groundwater Total				3E-03	4E-04	3E-05	3E-03		1E+01	5E+00	2E-01	2E+01
Receptor Total				3E-03	4E-04	3E-05	3E-03		1E+01	5E+00	2E-01	2E+01

TABLE 10.1.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**4**
Total Dermal HI Across Media =	**2**
Total Developmental HI Across Media =	**3**
Total Hepatic HI Across Media =	**3**
Total Immune HI Across Media =	**4**
Total Urinary HI Across Media =	**8**

TABLE 10.2.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Shallow Groundwater	Shallow Groundwater	Shallow Groundwater	Trichloroethene	2E-10	NA	3E-09	3E-09	Developmental, Cardiovascular, Immune	2E-02	NA	3E-01	3E-01
		Exposure Point Total		1E-08	NA	1E-07	1E-07		4E-02	NA	5E-01	6E-01
	Exposure Medium Total			1E-08	NA	1E-07	1E-07		4E-02	NA	5E-01	6E-01
Shallow Groundwater (cont.)	Trench Air	Vapors in a Trench	Naphthalene	NA	3E-08	NA	3E-08	Nervous, Respiratory	NA	6E-01	NA	6E-01
			Benzene	NA	8E-08	NA	8E-08	Immune	NA	3E-01	NA	3E-01
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	2E+01	NA	2E+01
			Methyl isobutyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	8E+00	NA	8E+00
			Methylene chloride	NA	5E-09	NA	5E-09	Hepatic	NA	9E-01	NA	9E-01
			Tetrachloroethene	NA	1E-08	NA	1E-08	Nervous, Ocular	NA	3E+00	NA	3E+00
			Toluene	NA	NA	NA	NA	Nervous	NA	2E+00	NA	2E+00
			Trichloroethene	NA	8E-07	NA	8E-07	Developmental, Cardiovascular, Immune	NA	2E+02	NA	2E+02
			Vinyl chloride	NA	5E-06	NA	5E-06	Hepatic	NA	2E+01	NA	2E+01
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	4E+00	NA	4E+00
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	1E+00	NA	1E+00
		Exposure Point Total		NA	7E-06	NA	7E-06		NA	3E+02	NA	3E+02
	Exposure Medium Total			NA	7E-06	NA	7E-06		NA	3E+02	NA	3E+02
Groundwater Total				1E-08	7E-06	1E-07	7E-06		4E-02	3E+02	5E-01	3E+02
Receptor Total				1E-08	7E-06	1E-07	7E-06		4E-02	3E+02	5E-01	3E+02

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**202**
Total Developmental HI Across Media =	**227**
Total Hepatic HI Across Media =	**17**
Total Immune HI Across Media =	**230**
Total Musculoskeletal HI Across Media =	**25**
Total Nervous HI Across Media =	**11**
Total Ocular HI Across Media =	**3**

TABLE 10.3.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	2E-01	NA	2E-01
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	9E-01	NA	9E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			Benzene	NA	NA	NA	NA	Immune	NA	4E-01	NA	4E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	5E+00	NA	5E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	5E-01	NA	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	9E+00	NA	9E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	4E+00	NA	4E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E+01	NA	2E+01

TABLE 10.3.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	4E-01	NA	2E-02	4E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	1E+00	NA	6E-02	1E+00
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	6E+00	NA	3E-02	6E+00
			Barium	NA	NA	NA	NA	Urinary	3E-01	NA	2E-02	3E-01
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	7E-01	NA	6E-02	8E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	1E-01	NA	1E-01	2E-01
			Acetone	NA	NA	NA	NA	Urinary	2E-01	NA	1E-03	2E-01
			Benzene	NA	NA	NA	NA	Immune	3E-01	NA	4E-02	3E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	3E+01	NA	3E+00	3E+01
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental	3E-01	NA	2E-03	3E-01
			Methylene chloride	NA	NA	NA	NA	Hepatic	8E-01	NA	3E-02	8E-01
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	3E-01	NA	2E-01	4E-01
			Toluene	NA	NA	NA	NA	Urinary	4E-01	NA	1E-01	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	2E+00	NA	3E-01	2E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	5E+00	NA	4E-01	5E+00
		Exposure Point Total		NA	NA	NA	NA		4E+01	NA	5E+00	5E+01
	Exposure Medium Total			NA	NA	NA	NA		4E+01	NA	5E+00	5E+01

TABLE 10.3.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	3E+00	NA	3E+00
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	2E+00	NA	2E+00
			Benzene	NA	NA	NA	NA	Immune	NA	6E-01	NA	6E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	2E+01	NA	2E+01
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	5E-01	NA	5E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	3E-01	NA	3E-01
			Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	2E+00	NA	2E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	7E-01	NA	7E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	2E+00	NA	2E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	4E+01	NA	4E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	4E+01	NA	4E+01
Groundwater Total				NA	NA	NA	NA		4E+01	6E+01	5E+00	1E+02
Receptor Total				NA	NA	NA	NA		4E+01	6E+01	5E+00	1E+02

TABLE 10.3.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**23**
Total Dermal HI Across Media =	**6**
Total Developmental HI Across Media =	**19**
Total Hepatic HI Across Media =	**15**
Total Immune HI Across Media =	**46**
Total Nervous HI Across Media =	**8**
Total Ocular HI Across Media =	**2**
Total Respiratory HI Across Media =	**5**
Total Urinary HI Across Media =	**33**

TABLE 10.4.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	2E-01	NA	2E-01
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	9E-01	NA	9E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			Benzene	NA	NA	NA	NA	Immune	NA	4E-01	NA	4E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Immune	NA	5E+00	NA	5E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	5E-01	NA	5E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	9E+00	NA	9E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	4E+00	NA	4E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	2E-01	NA	2E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E+01	NA	2E+01

TABLE 10.4.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Tapwater	Tapwater	2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	6E-01	NA	2E-02	6E-01
			4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	Hepatic	2E+00	NA	9E-02	2E+00
			Arsenic	NA	NA	NA	NA	Cardiovascular, Dermal	9E+00	NA	4E-02	9E+00
			Barium	NA	NA	NA	NA	Urinary	5E-01	NA	3E-02	5E-01
			1,1-Dichloroethane	NA	NA	NA	NA	Urinary	1E+00	NA	8E-02	1E+00
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	2E-01	NA	2E-01	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Urinary	2E-01	NA	8E-03	2E-01
			Acetone	NA	NA	NA	NA	Urinary	4E-01	NA	2E-03	4E-01
			Benzene	NA	NA	NA	NA	Immune	4E-01	NA	6E-02	5E-01
			cis-1,2-Dichloroethene	NA	NA	NA	NA	Urinary	5E+01	NA	5E+00	5E+01
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental	4E-01	NA	3E-03	4E-01
			Methylene chloride	NA	NA	NA	NA	Hepatic	1E+00	NA	4E-02	1E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	5E-01	NA	2E-01	7E-01
			Toluene	NA	NA	NA	NA	Urinary	6E-01	NA	2E-01	8E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	3E+00	NA	4E-01	3E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	8E+00	NA	6E-01	9E+00
		Exposure Point Total		NA	NA	NA	NA		7E+01	NA	7E+00	8E+01
	Exposure Medium Total			NA	NA	NA	NA		7E+01	NA	7E+00	8E+01

TABLE 10.4.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,1-Trichloroethane	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,1,2-Trichloroethane	NA	NA	NA	NA	Respiratory	NA	3E+00	NA	3E+00
			1,1-Dichloroethene	NA	NA	NA	NA	Hepatic	NA	2E-01	NA	2E-01
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
			1,2-Dichloroethane	NA	NA	NA	NA	Nervous	NA	2E+00	NA	2E+00
			Benzene	NA	NA	NA	NA	Immune	NA	6E-01	NA	6E-01
			Methyl ethyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	5E-01	NA	5E-01
			Methyl isobutyl ketone	NA	NA	NA	NA	Developmental, Musculoskeletal	NA	3E-01	NA	3E-01
			Naphthalene	NA	NA	NA	NA	Nervous, Respiratory	NA	2E+00	NA	2E+00
			Tetrachloroethene	NA	NA	NA	NA	Nervous, Ocular	NA	7E-01	NA	7E-01
			Trichloroethene	NA	NA	NA	NA	Developmental, Cardiovascular, Immune	NA	6E+00	NA	6E+00
			Vinyl chloride	NA	NA	NA	NA	Hepatic	NA	2E+00	NA	2E+00
			Xylene, m,p-	NA	NA	NA	NA	Nervous	NA	8E-01	NA	8E-01
			Xylene, o-	NA	NA	NA	NA	Nervous	NA	3E-01	NA	3E-01
		Exposure Point Total		NA	NA	NA	NA		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	NA	NA	NA		NA	2E+01	NA	2E+01
Groundwater Total				NA	NA	NA	NA		7E+01	4E+01	7E+00	1E+02
Receptor Total				NA	NA	NA	NA		7E+01	4E+01	7E+00	1E+02

TABLE 10.4.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes: HI = Hazard Index; NA = Not applicable or not available

Total Cardiovascular HI Across Media =	**28**
Total Dermal HI Across Media =	**9**
Total Developmental HI Across Media =	**20**
Total Hepatic HI Across Media =	**21**
Total Immune HI Across Media =	**25**
Total Nervous HI Across Media =	**8**
Total Ocular HI Across Media =	**2**
Total Respiratory HI Across Media =	**5**
Total Urinary HI Across Media =	**54**

TABLE 10.5.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air (Vapor Intrusion)	Indoor Air (Vapor Intrusion)	1,1-Dichloroethane	NA	4E-04	NA	4E-04	NA	NA	NA	NA	NA
			1,2-Dichloroethane	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Benzene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
			Ethylbenzene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	NA	2E-06	NA	2E-06	NA	NA	NA	NA	NA
			Trichloroethene	NA	4E-05	NA	4E-05	NA	NA	NA	NA	NA
			Vinyl chloride	NA	8E-04	NA	8E-04	NA	NA	NA	NA	NA
		Exposure Point Total		NA	1E-03	NA	1E-03		NA	NA	NA	NA
	Exposure Medium Total			NA	1E-03	NA	1E-03		NA	NA	NA	NA
Groundwater (cont.)	Tapwater	Tapwater	RDX	5E-06	NA	4E-08	5E-06	NA	NA	NA	NA	NA
			Arsenic	1E-03	NA	6E-06	1E-03	NA	NA	NA	NA	NA
			1,1-Dichloroethane	4E-04	NA	3E-05	4E-04	NA	NA	NA	NA	NA
			1,2-Dichloroethane	3E-05	NA	1E-06	3E-05	NA	NA	NA	NA	NA
			Benzene	2E-05	NA	4E-06	3E-05	NA	NA	NA	NA	NA
			Ethylbenzene	5E-06	NA	3E-06	8E-06	NA	NA	NA	NA	NA
			Methylene chloride	1E-05	NA	4E-07	1E-05	NA	NA	NA	NA	NA
			Naphthalene	2E-05	NA	9E-06	2E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	2E-06	NA	9E-07	2E-06	NA	NA	NA	NA	NA
			Trichloroethene	2E-05	NA	2E-04	2E-04	NA	NA	NA	NA	NA
			Vinyl chloride	6E-03	NA	5E-04	7E-03	NA	NA	NA	NA	NA
		Exposure Point Total		8E-03	NA	7E-04	9E-03		NA	NA	NA	NA
	Exposure Medium Total			8E-03	NA	7E-04	9E-03		NA	NA	NA	NA

TABLE 10.5.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
Fire Training Pit
Iowa Army Ammunition Plant, Middletown, Iowa

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.)	Household Air (Domestic Use)	Vapors in House (Domestic Use)	1,1,2-Trichloroethane	NA	3E-06	NA	3E-06	NA	NA	NA	NA	NA
			1,1-Dichloroethane	NA	1E-03	NA	1E-03	NA	NA	NA	NA	NA
			1,2-Dichloroethane	NA	1E-04	NA	1E-04	NA	NA	NA	NA	NA
			Benzene	NA	5E-05	NA	5E-05	NA	NA	NA	NA	NA
			Ethylbenzene	NA	2E-05	NA	2E-05	NA	NA	NA	NA	NA
			Naphthalene	NA	6E-05	NA	6E-05	NA	NA	NA	NA	NA
			Tetrachloroethene	NA	3E-06	NA	3E-06	NA	NA	NA	NA	NA
			Trichloroethene	NA	3E-05	NA	3E-05	NA	NA	NA	NA	NA
			Vinyl chloride	NA	5E-04	NA	5E-04	NA	NA	NA	NA	NA
		Exposure Point Total		NA	2E-03	NA	2E-03		NA	NA	NA	NA
	Exposure Medium Total			NA	2E-03	NA	2E-03		NA	NA	NA	NA
Groundwater Total				8E-03	3E-03	7E-04	1E-02		NA	NA	NA	NA
Receptor Total				8E-03	3E-03	7E-04	1E-02		NA	NA	NA	NA

Notes: NA = Not applicable or not available

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	4-Nitrotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	HMX	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	RDX	0.36	J	µg/L	0.16	0.4
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,1,1-Trichloroethane	0.89	J	µg/L	0.16	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	J	µg/L	0.18	3
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,1-Dichloroethane	0.85	J	µg/L	0.22	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,1-Dichloroethene	2.7	=	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	cis-1,2-Dichloroethene	0.45	J	µg/L	0.15	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Trichloroethene	0.32	J	µg/L	0.16	1
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-1	FTA-99-1-0319	WG	3/19/2019	7	17	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	DNX	0.26	U	µg/L	0.26	0.51
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	HMX	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-99-2	FTA-99-2-0319	WG	3/21/2019	40	50	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Barium	230	=	µg/L	1.8	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Lead	2	U	µg/L	2	3
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethane	3.1	J	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trimethylbenzene	0.33	J	µg/L	0.15	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Benzene	4.9	J	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroethane	2.5	J	µg/L	1.6	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,2-Dichloroethene	1	J	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Ethyl- benzene	1.4	J	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Propylbenzene	0.22	J	µg/L	0.16	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Toluene	0.18	J	µg/L	0.17	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Vinyl chloride	0.24	J	µg/L	0.1	1.5
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, m,p-	0.19	J	µg/L	0.15	2
AOC_GW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Arsenic	46	J	µg/L	20	50
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Barium	2000	=	µg/L	9	10
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Cadmium	2	U	µg/L	2	2.5
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chromium	40	U	µg/L	40	50
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Lead	10	U	µg/L	10	15
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Mercury	0.75	U	µg/L	0.75	1
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Selenium	20	U	µg/L	20	25
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Silver	9	U	µg/L	9	10
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Naphthalene	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	16	U	µg/L	16	120
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	230	=	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	42	=	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	34	J	µg/L	6	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	33	J	µg/L	5.2	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	9.9	J	µg/L	6.4	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1-Chlorohexane	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Chlorotoluene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Hexanone	160	U	µg/L	160	200
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Acetone	6700	=	µg/L	260	400
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Benzene	46	=	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromobenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromochloromethane	8	U	µg/L	8	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromodichloromethane	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromoform	40	U	µg/L	40	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromomethane	32	UJ	µg/L	32	80
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon disulfide	32	U	µg/L	32	80
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon tetrachloride	16	U	µg/L	16	80
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloro methane	32	U	µg/L	32	80
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chlorobenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroethane	130	=	µg/L	64	80
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroform	6.6	U	µg/L	6.4	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	230	=	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromochloromethane	16	U	µg/L	16	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromomethane	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	32	U	µg/L	32	80
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Ethyl- benzene	40	=	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Isopropylbenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	5100	=	µg/L	160	240
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	1700	=	µg/L	130	200
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methylene chloride	160	J	µg/L	38	200
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Butylbenzene	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Propylbenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	p-Chlorotoluene	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	sec-Butylbenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Styrene	32	U	µg/L	32	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	tert-Butylbenzene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Tetrachloroethene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Toluene	1900	=	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichloroethene	59	=	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Vinyl chloride	53	J	µg/L	4	60
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, m,p-	150	=	µg/L	32	80
AOC_GW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, o-	59	=	µg/L	16	40
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Arsenic	17	=	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Barium	310	=	µg/L	1.8	2
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Lead	2	U	µg/L	2	3
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Naphthalene	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	2000	=	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	40	U	µg/L	40	300
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	4900	=	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	270	=	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	80	U	µg/L	80	300
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	110	=	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	160	U	µg/L	160	500
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	81	J	µg/L	13	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	34	J	µg/L	16	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	20	U	µg/L	20	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1-Chlorohexane	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2-Chlorotoluene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2-Hexanone	400	U	µg/L	400	500
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	40	U	µg/L	40	100

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Acetone	640	U	µg/L	640	1000
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Benzene	88	J	µg/L	16	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromobenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromochloromethane	20	U	µg/L	20	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromodichloromethane	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromoform	100	U	µg/L	100	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromomethane	80	U	µg/L	80	200
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Carbon disulfide	26	J	µg/L	17	200
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Carbon tetrachloride	40	U	µg/L	40	200
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloro methane	80	U	µg/L	80	200
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chlorobenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloroethane	1100	=	µg/L	160	200
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloroform	20	U	µg/L	16	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	2000	=	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dibromochloromethane	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dibromomethane	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	80	U	µg/L	80	200
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Ethyl- benzene	130	=	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Isopropylbenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	400	U	µg/L	400	600
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	320	U	µg/L	320	500
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	80	U	µg/L	80	500
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methylene chloride	200	U	µg/L	200	500
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	N-Butylbenzene	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	N-Propylbenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	p-Chlorotoluene	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	sec-Butylbenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Styrene	80	U	µg/L	80	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	tert-Butylbenzene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Tetrachloroethene	59	J	µg/L	20	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Toluene	3500	=	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Trichloroethene	40	U	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	80	U	µg/L	80	200
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Vinyl chloride	510	=	µg/L	20	150
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Xylene, m,p-	570	=	µg/L	80	200
AOC_GW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Xylene, o-	210	=	µg/L	40	100
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Arsenic	26	=	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Barium	350	=	µg/L	1.8	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Lead	2	U	µg/L	2	3
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Naphthalene	3.7	=	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichlorobenzene	0.41	J	µg/L	0.15	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1-Trichloroethane	0.24	J	µg/L	0.16	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethane	24	=	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trimethylbenzene	25	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3,5-Trimethylbenzene	4.7	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	4-Isopropyltoluene	0.49	J	µg/L	0.2	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Benzene	45	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroethane	250	=	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,2-Dichloroethene	1.5	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Ethyl- benzene	34	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Isopropylbenzene	2.3	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methylene chloride	7.6	=	µg/L	2	5
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Propylbenzene	3.8	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	sec-Butylbenzene	1.2	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Toluene	27	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,2-Dichloroethene	0.42	J	µg/L	0.15	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Vinyl chloride	2	=	µg/L	0.2	1.5
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, m,p-	84	=	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, o-	14	=	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	HMX	0.45	J	µg/L	0.2	0.4
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Barium	340	=	µg/L	1.8	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Lead	2	U	µg/L	2	3
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	0.71	J	µg/L	0.22	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Benzene	0.98	J	µg/L	0.16	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Ethyl- benzene	0.31	J	µg/L	0.16	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	sec-Butylbenzene	0.17	J	µg/L	0.17	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	DNX	0.25	U	µg/L	0.25	0.51
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	HMX	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	TNX	0.25	U	µg/L	0.25	0.51
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1-Dichloroethane	0.58	J	µg/L	0.22	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,1,1-Trichloroethane	0.95	J	µg/L	0.16	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,1-Dichloroethane	0.81	J	µg/L	0.22	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,1-Dichloroethene	3	=	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	cis-1,2-Dichloroethene	0.54	J	µg/L	0.15	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Trichloroethene	0.22	J	µg/L	0.16	1
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW2	FTP-MW2-R0319	WG	3/23/2019	6.9	16.9	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	1,3,5-Trinitrobenzene	0.42	U	µg/L	0.42	1.1
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	2,4,6-Trinitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	2-Amino-4,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	2-Nitrotoluene	0.21	U	µg/L	0.21	0.42
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	3-Nitrotoluene	0.42	U	µg/L	0.42	0.42
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	4-Amino-2,6-dinitrotoluene	0.13	U	µg/L	0.13	0.21
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	4-Nitrotoluene	0.42	U	µg/L	0.42	1.1
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	DNX	0.26	U	µg/L	0.26	0.53
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	HMX	0.21	U	µg/L	0.21	0.42
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	MNX	0.31	U	µg/L	0.31	0.53
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	Nitrobenzene	0.21	U	µg/L	0.21	0.42
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	RDX	0.42	U	µg/L	0.42	0.42
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_FTA	FTP-MW3	FTP-MW3-0319	WG	3/8/2019	10.5	20.5	TNX	0.26	U	µg/L	0.26	0.53
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Chlorobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW3	FTP-MW3-R0319	WG	3/23/2019	10.5	20.5	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.97
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	0.19
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.19
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2-Nitrotoluene	0.19	UJ	µg/L	0.19	0.39
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.19
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.97
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	DNX	0.24	U	µg/L	0.24	0.49
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	HMX	0.19	U	µg/L	0.19	0.39
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	MNX	0.28	U	µg/L	0.28	0.49
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Nitrobenzene	0.19	UJ	µg/L	0.19	0.39
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	RDX	0.39	U	µg/L	0.39	0.39
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Tetryl	0.19	U	µg/L	0.19	0.23
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	TNX	0.24	U	µg/L	0.24	0.49
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Barium	42	=	µg/L	1.8	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Lead	2	U	µg/L	2	3
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,1-Trichloroethane	23	J	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,2-Trichloroethane	0.4	J	µg/L	0.27	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1-Dichloroethane	0.72	J	µg/L	0.22	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1-Dichloroethene	55	J	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Styrene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Tetrachloroethene	0.64	J	µg/L	0.2	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.21	U	µg/L	0.18	3
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Methyl ethyl ketone	4	U	µg/L	4	6

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.8	J	µg/L	0.18	3
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Chloroform	0.4	U	µg/L	0.4	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Bromodichloromethane	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	FTP-MW8	FTP-MW8-0319	WG	3/9/2019	41.1	51.1	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Barium	93	J	µg/L	1.8	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Lead	2	U	µg/L	2	3
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,1-Trichloroethane	0.5	J	µg/L	0.16	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloroethene	1.4	J	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Tetrachloroethene	0.38	J	µg/L	0.2	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	DNX	0.26	U	µg/L	0.26	0.52
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	HMX	0.24	J	µg/L	0.09	0.41
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	MNX	0.3	U	µg/L	0.3	0.52
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	RDX	1.4	=	µg/L	0.41	0.41
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	TNX	0.26	U	µg/L	0.26	0.52
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Barium	160	J	µg/L	1.8	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Lead	2	U	µg/L	2	3
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,1-Trichloroethane	32	=	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,2-Trichloroethane	1.3	=	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1-Dichloroethane	3.9	=	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1-Dichloroethene	110	J	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dichloroethane	0.82	J	µg/L	0.13	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chloroform	0.19	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	cis-1,2-Dichloroethene	1.5	=	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Tetrachloroethene	7	=	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Trichloroethene	0.29	J	µg/L	0.16	1
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Barium	280	=	µg/L	1.8	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Lead	2	U	µg/L	2	3
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,1-Trichloroethane	12	J	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,2-Trichloroethane	2.5	J	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.56	J	µg/L	0.18	3
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1-Dichloroethane	140	J	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1-Dichloroethene	210	J	µg/L	4	5
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dichloroethane	30	J	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	2-Hexanone	4	UJ	µg/L	4	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Benzene	0.87	J	µg/L	0.16	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chloroethane	5.8	J	µg/L	1.6	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chloroform	1.8	U	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	cis-1,2-Dichloroethene	190	J	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Tetrachloroethene	1.9	J	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	trans-1,2-Dichloroethene	0.58	J	µg/L	0.15	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Trichloroethene	37	J	µg/L	0.4	1
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Vinyl chloride	1.3	J	µg/L	0.1	1.5
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,1-Trichloroethane	88	=	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2-Trichloroethane	0.64	J	µg/L	0.27	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloroethane	18	=	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloroethene	83	=	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dibromoethane	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichloroethane	1.7	=	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloroform	0.79	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	cis-1,2-Dichloroethene	37	=	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Tetrachloroethene	24	=	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Trichloroethene	82	=	µg/L	0.4	1
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Barium	110	=	µg/L	1.8	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Lead	2	U	µg/L	2	3
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Selenium	4.3	J	µg/L	2	5
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Acetone	6.4	U	µg/L	6.4	10
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	HMX	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	RDX	0.46	=	µg/L	0.4	0.4
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Barium	160	=	µg/L	1.8	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Lead	2	U	µg/L	2	3
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2-Hexanone	4	U	µg/L	4	5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Acetone	6.4	U	µg/L	6.4	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromoform	1	U	µg/L	1	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Methylene chloride	2	U	µg/L	2	5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Styrene	0.8	U	µg/L	0.8	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Toluene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	DNX	0.26	U	µg/L	0.26	0.51
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	HMX	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Arsenic	8	U	µg/L	8	10
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Barium	260	J	µg/L	1.8	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chromium	8	U	µg/L	8	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Lead	2	U	µg/L	2	3
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,1-Trichloroethane	7.5	J	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.64	J	µg/L	0.18	3
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloroethane	6.5	J	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloroethene	39	J	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichloroethane	1.6	J	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloroform	0.35	J	µg/L	0.16	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	cis-1,2-Dichloroethene	6.3	J	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Tetrachloroethene	0.81	J	µg/L	0.2	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Trichloroethene	2.8	J	µg/L	0.4	1
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	4	J	µg/L	0.4	3
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromoform	1	UJ	µg/L	1	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Ethyl- benzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.96
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	0.19
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Amino-4,6-dinitrotoluene	1.2	J	µg/L	0.12	0.19
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Nitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Amino-2,6-dinitrotoluene	4.4	J	µg/L	0.12	0.19
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Nitrotoluene	0.39	U	µg/L	0.39	0.96
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	DNX	0.24	U	µg/L	0.24	0.48
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	HMX	0.19	U	µg/L	0.19	0.39
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	MNX	0.28	U	µg/L	0.28	0.48
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Nitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	RDX	5.1	J	µg/L	0.39	0.39
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetryl	0.19	U	µg/L	0.19	0.23
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	TNX	0.24	U	µg/L	0.24	0.48
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Arsenic	56	=	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Barium	510	=	µg/L	1.8	2
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chromium	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Lead	2	U	µg/L	2	3
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Selenium	4	U	µg/L	4	5
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Silver	1.8	U	µg/L	1.8	2
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Naphthalene	10	=	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1-Trichloroethane	9.7	J	µg/L	1.6	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.1	J	µg/L	1.8	30
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethane	200	=	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethene	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloropropene	4	U	µg/L	4	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trimethylbenzene	63	=	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloroethane	9.9	J	µg/L	1.3	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trimethylbenzene	16	=	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1-Chlorohexane	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Chlorotoluene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Hexanone	40	U	µg/L	40	50
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Isopropyltoluene	3.4	J	µg/L	2	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Acetone	200	=	µg/L	64	100
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Benzene	82	=	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromobenzene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromochloromethane	2	U	µg/L	2	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromodichloromethane	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromoform	10	U	µg/L	10	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromomethane	8	U	µg/L	8	20
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon disulfide	8	U	µg/L	8	20
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon tetrachloride	4	U	µg/L	4	20
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloro methane	8	U	µg/L	8	20
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chlorobenzene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroethane	690	=	µg/L	16	20
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroform	1.9	U	µg/L	1.6	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,2-Dichloroethene	3	J	µg/L	1.5	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromochloromethane	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromomethane	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dichlorodifluoromethane	8	U	µg/L	8	20
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Ethyl- benzene	66	=	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Isopropylbenzene	3.9	J	µg/L	1.9	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl ethyl ketone	44	J	µg/L	20	60
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl isobutyl ketone	110	=	µg/L	32	50
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methylene chloride	59	=	µg/L	20	50
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Butylbenzene	1.7	J	µg/L	1.4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Propylbenzene	5.7	J	µg/L	1.6	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	p-Chlorotoluene	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	sec-Butylbenzene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Styrene	8	U	µg/L	8	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	tert-Butylbenzene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetrachloroethene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Toluene	1400	=	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichloroethene	4	U	µg/L	4	10
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Vinyl chloride	2	U	µg/L	2	15
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, m,p-	270	=	µg/L	8	20
AOC_GW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, o-	86	=	µg/L	4	10
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Barium	230	=	µg/L	1.8	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethane	3.1	J	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trimethylbenzene	0.33	J	µg/L	0.15	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Benzene	4.9	J	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroethane	2.5	J	µg/L	1.6	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,2-Dichloroethene	1	J	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Ethyl- benzene	1.4	J	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Propylbenzene	0.22	J	µg/L	0.16	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Toluene	0.18	J	µg/L	0.17	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Vinyl chloride	0.24	J	µg/L	0.1	1.5
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, m,p-	0.19	J	µg/L	0.15	2
AOC_GW-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Arsenic	46	J	µg/L	20	50
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Barium	2000	=	µg/L	9	10
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Cadmium	2	U	µg/L	2	2.5
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chromium	40	U	µg/L	40	50
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Lead	10	U	µg/L	10	15
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Mercury	0.75	U	µg/L	0.75	1
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Selenium	20	U	µg/L	20	25
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Silver	9	U	µg/L	9	10
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Naphthalene	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	16	U	µg/L	16	120
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	230	=	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	42	=	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	34	J	µg/L	6	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	33	J	µg/L	5.2	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	9.9	J	µg/L	6.4	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1-Chlorohexane	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Chlorotoluene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Hexanone	160	U	µg/L	160	200
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Acetone	6700	=	µg/L	260	400
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Benzene	46	=	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromobenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromochloromethane	8	U	µg/L	8	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromodichloromethane	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromoform	40	U	µg/L	40	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromomethane	32	UJ	µg/L	32	80
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon disulfide	32	U	µg/L	32	80
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon tetrachloride	16	U	µg/L	16	80
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloro methane	32	U	µg/L	32	80
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chlorobenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroethane	130	=	µg/L	64	80
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroform	6.6	U	µg/L	6.4	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	230	=	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromochloromethane	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromomethane	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	32	U	µg/L	32	80
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Ethyl- benzene	40	=	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Isopropylbenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	5100	=	µg/L	160	240
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	1700	=	µg/L	130	200
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methylene chloride	160	J	µg/L	38	200
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Butylbenzene	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Propylbenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	p-Chlorotoluene	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	sec-Butylbenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Styrene	32	U	µg/L	32	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	tert-Butylbenzene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Tetrachloroethene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Toluene	1900	=	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichloroethene	59	=	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Vinyl chloride	53	J	µg/L	4	60
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, m,p-	150	=	µg/L	32	80
AOC_GW-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, o-	59	=	µg/L	16	40
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Arsenic	17	=	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Barium	310	=	µg/L	1.8	2
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Naphthalene	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	2000	=	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	40	U	µg/L	40	300
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	4900	=	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	270	=	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	80	U	µg/L	80	300
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	110	=	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	160	U	µg/L	160	500
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	81	J	µg/L	13	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	34	J	µg/L	16	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	20	U	µg/L	20	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1-Chlorohexane	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	80	U	µg/L	80	100

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2-Chlorotoluene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2-Hexanone	400	U	µg/L	400	500
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Acetone	640	U	µg/L	640	1000
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Benzene	88	J	µg/L	16	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromobenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromochloromethane	20	U	µg/L	20	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromodichloromethane	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromoform	100	U	µg/L	100	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromomethane	80	U	µg/L	80	200
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Carbon disulfide	26	J	µg/L	17	200
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Carbon tetrachloride	40	U	µg/L	40	200
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloro methane	80	U	µg/L	80	200
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chlorobenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloroethane	1100	=	µg/L	160	200
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloroform	20	U	µg/L	16	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	2000	=	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dibromochloromethane	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dibromomethane	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	80	U	µg/L	80	200
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Ethyl- benzene	130	=	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Isopropylbenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	400	U	µg/L	400	600
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	320	U	µg/L	320	500
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	80	U	µg/L	80	500
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methylene chloride	200	U	µg/L	200	500
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	N-Butylbenzene	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	N-Propylbenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	p-Chlorotoluene	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	sec-Butylbenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Styrene	80	U	µg/L	80	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	tert-Butylbenzene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Tetrachloroethene	59	J	µg/L	20	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Toluene	3500	=	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Trichloroethene	40	U	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	80	U	µg/L	80	200
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Vinyl chloride	510	=	µg/L	20	150
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Xylene, m,p-	570	=	µg/L	80	200
AOC_GW-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Xylene, o-	210	=	µg/L	40	100
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Arsenic	26	=	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Barium	350	=	µg/L	1.8	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Selenium	4	U	µg/L	4	5
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Naphthalene	3.7	=	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichlorobenzene	0.41	J	µg/L	0.15	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1-Trichloroethane	0.24	J	µg/L	0.16	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethane	24	=	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trimethylbenzene	25	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3,5-Trimethylbenzene	4.7	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	4-Isopropyltoluene	0.49	J	µg/L	0.2	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Benzene	45	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroethane	250	=	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,2-Dichloroethene	1.5	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Ethyl- benzene	34	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Isopropylbenzene	2.3	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methylene chloride	7.6	=	µg/L	2	5
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Propylbenzene	3.8	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	sec-Butylbenzene	1.2	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Toluene	27	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,2-Dichloroethene	0.42	J	µg/L	0.15	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Vinyl chloride	2	=	µg/L	0.2	1.5
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, m,p-	84	=	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, o-	14	=	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	HMX	0.45	J	µg/L	0.2	0.4
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	MNX	0.29	U	µg/L	0.29	0.5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	RDX	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Barium	340	=	µg/L	1.8	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	0.71	J	µg/L	0.22	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Benzene	0.98	J	µg/L	0.16	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Ethyl- benzene	0.31	J	µg/L	0.16	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	sec-Butylbenzene	0.17	J	µg/L	0.17	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	DNX	0.25	U	µg/L	0.25	0.51
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	HMX	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-0319	WG	3/8/2019	5.5	15.5	TNX	0.25	U	µg/L	0.25	0.51
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1-Dichloroethane	0.58	J	µg/L	0.22	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW1	FTP-MW1-R0319	WG	3/23/2019	5.5	15.5	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.8	J	µg/L	0.18	3
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	FTP-MW7	FTP-MW7-0319	WG	3/9/2019	11	21	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Barium	93	J	µg/L	1.8	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,1-Trichloroethane	0.5	J	µg/L	0.16	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloroethene	1.4	J	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dibromomethane	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Tetrachloroethene	0.38	J	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,1-Trichloroethane	88	=	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2-Trichloroethane	0.64	J	µg/L	0.27	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloroethane	18	=	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloroethene	83	=	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichloroethane	1.7	=	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Carbon tetrachloride	0.4	U	µg/L	0.4	2

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloroform	0.79	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	cis-1,2-Dichloroethene	37	=	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Tetrachloroethene	24	=	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Trichloroethene	82	=	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Barium	110	=	µg/L	1.8	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Selenium	4.3	J	µg/L	2	5
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,2-Dichloropropane	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-62	JAW-62-0319	WG	3/21/2019	9	19	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	DNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	HMX	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	MNX	0.29	U	µg/L	0.29	0.5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	RDX	0.46	=	µg/L	0.4	0.4
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	TNX	0.25	U	µg/L	0.25	0.5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Barium	160	=	µg/L	1.8	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Naphthalene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	2-Hexanone	4	U	µg/L	4	5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Acetone	6.4	U	µg/L	6.4	10
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Benzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromoform	1	U	µg/L	1	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Bromomethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chloro methane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chloroethane	1.6	U	µg/L	1.6	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Chloroform	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Ethyl- benzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Methylene chloride	2	U	µg/L	2	5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Styrene	0.8	U	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Toluene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-63	JAW-63-0319	WG	3/21/2019	10	20	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	DNX	0.26	U	µg/L	0.26	0.51
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	HMX	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	MNX	0.3	U	µg/L	0.3	0.51
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	RDX	0.41	U	µg/L	0.41	0.41
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	TNX	0.26	U	µg/L	0.26	0.51
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Arsenic	8	U	µg/L	8	10
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Barium	260	J	µg/L	1.8	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Selenium	4	U	µg/L	4	5
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,1-Trichloroethane	7.5	J	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.64	J	µg/L	0.18	3
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloroethane	6.5	J	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloroethene	39	J	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichloroethane	1.6	J	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloroform	0.35	J	µg/L	0.16	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	cis-1,2-Dichloroethene	6.3	J	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Tetrachloroethene	0.81	J	µg/L	0.2	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Trichloroethene	2.8	J	µg/L	0.4	1
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	4	J	µg/L	0.4	3
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	2-Hexanone	4	UJ	µg/L	4	5
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Acetone	6.4	UJ	µg/L	6.4	10
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromoform	1	UJ	µg/L	1	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Methylene chloride	2	UJ	µg/L	2	5
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Styrene	0.8	UJ	µg/L	0.8	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Toluene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_GW-CW_FTA	M-01	M-01-0319	WG	3/24/2019	8	18	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.96
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	0.19
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Amino-4,6-dinitrotoluene	1.2	J	µg/L	0.12	0.19
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Nitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Amino-2,6-dinitrotoluene	4.4	J	µg/L	0.12	0.19
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Nitrotoluene	0.39	U	µg/L	0.39	0.96
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	DNX	0.24	U	µg/L	0.24	0.48
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	HMX	0.19	U	µg/L	0.19	0.39
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	MNX	0.28	U	µg/L	0.28	0.48
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Nitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	RDX	5.1	J	µg/L	0.39	0.39
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetryl	0.19	U	µg/L	0.19	0.23
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	TNX	0.24	U	µg/L	0.24	0.48
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Arsenic	56	=	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Barium	510	=	µg/L	1.8	2
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chromium	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Lead	2	U	µg/L	2	3
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Mercury	0.15	U	µg/L	0.15	0.2
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Selenium	4	U	µg/L	4	5
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Silver	1.8	U	µg/L	1.8	2
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Naphthalene	10	=	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1-Trichloroethane	9.7	J	µg/L	1.6	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.1	J	µg/L	1.8	30
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethane	200	=	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethene	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trimethylbenzene	63	=	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloroethane	9.9	J	µg/L	1.3	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trimethylbenzene	16	=	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1-Chlorohexane	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Chlorotoluene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Hexanone	40	U	µg/L	40	50
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Isopropyltoluene	3.4	J	µg/L	2	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Acetone	200	=	µg/L	64	100
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Benzene	82	=	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromobenzene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromochloromethane	2	U	µg/L	2	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromodichloromethane	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromoform	10	U	µg/L	10	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromomethane	8	U	µg/L	8	20
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon disulfide	8	U	µg/L	8	20
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon tetrachloride	4	U	µg/L	4	20
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloro methane	8	U	µg/L	8	20
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chlorobenzene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroethane	690	=	µg/L	16	20
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroform	1.9	U	µg/L	1.6	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,2-Dichloroethene	3	J	µg/L	1.5	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromochloromethane	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromomethane	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dichlorodifluoromethane	8	U	µg/L	8	20
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Ethyl- benzene	66	=	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Isopropylbenzene	3.9	J	µg/L	1.9	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl ethyl ketone	44	J	µg/L	20	60
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl isobutyl ketone	110	=	µg/L	32	50
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methylene chloride	59	=	µg/L	20	50
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Butylbenzene	1.7	J	µg/L	1.4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Propylbenzene	5.7	J	µg/L	1.6	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	p-Chlorotoluene	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	sec-Butylbenzene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Styrene	8	U	µg/L	8	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	tert-Butylbenzene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetrachloroethene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Toluene	1400	=	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichloroethene	4	U	µg/L	4	10
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Vinyl chloride	2	U	µg/L	2	15
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, m,p-	270	=	µg/L	8	20
AOC_GW-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, o-	86	=	µg/L	4	10
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Barium	230	=	µg/L	1.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Lead	2	U	µg/L	2	3
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethane	3.1	J	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trimethylbenzene	0.33	J	µg/L	0.15	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Benzene	4.9	J	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroethane	2.5	J	µg/L	1.6	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,2-Dichloroethene	1	J	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Ethyl- benzene	1.4	J	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Propylbenzene	0.22	J	µg/L	0.16	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Toluene	0.18	J	µg/L	0.17	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Vinyl chloride	0.24	J	µg/L	0.1	1.5
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, m,p-	0.19	J	µg/L	0.15	2
AOC_RDX-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Arsenic	46	J	µg/L	20	50
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Barium	2000	=	µg/L	9	10
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Cadmium	2	U	µg/L	2	2.5
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chromium	40	U	µg/L	40	50
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Lead	10	U	µg/L	10	15
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Mercury	0.75	U	µg/L	0.75	1
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Selenium	20	U	µg/L	20	25
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Silver	9	U	µg/L	9	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Naphthalene	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	16	U	µg/L	16	120
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	230	=	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	42	=	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	34	J	µg/L	6	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	33	J	µg/L	5.2	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	9.9	J	µg/L	6.4	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1-Chlorohexane	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Chlorotoluene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Hexanone	160	U	µg/L	160	200
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Acetone	6700	=	µg/L	260	400
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Benzene	46	=	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromobenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromochloromethane	8	U	µg/L	8	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromodichloromethane	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromoform	40	U	µg/L	40	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromomethane	32	UJ	µg/L	32	80
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon disulfide	32	U	µg/L	32	80
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon tetrachloride	16	U	µg/L	16	80
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloro methane	32	U	µg/L	32	80
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chlorobenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroethane	130	=	µg/L	64	80
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroform	6.6	U	µg/L	6.4	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	230	=	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromochloromethane	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromomethane	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	32	U	µg/L	32	80
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Ethyl- benzene	40	=	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Isopropylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	5100	=	µg/L	160	240
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	1700	=	µg/L	130	200
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methylene chloride	160	J	µg/L	38	200
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Butylbenzene	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Propylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	p-Chlorotoluene	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	sec-Butylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Styrene	32	U	µg/L	32	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	tert-Butylbenzene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Tetrachloroethene	16	U	µg/L	16	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Toluene	1900	=	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichloroethene	59	=	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Vinyl chloride	53	J	µg/L	4	60
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, m,p-	150	=	µg/L	32	80
AOC_RDX-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, o-	59	=	µg/L	16	40
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Arsenic	26	=	µg/L	8	10
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Barium	350	=	µg/L	1.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chromium	8	U	µg/L	8	10
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Lead	2	U	µg/L	2	3
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Selenium	4	U	µg/L	4	5
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Naphthalene	3.7	=	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichlorobenzene	0.41	J	µg/L	0.15	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1-Trichloroethane	0.24	J	µg/L	0.16	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethane	24	=	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trimethylbenzene	25	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3,5-Trimethylbenzene	4.7	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	4-Isopropyltoluene	0.49	J	µg/L	0.2	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Benzene	45	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromoform	1	U	µg/L	1	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromomethane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroethane	250	=	µg/L	8	10
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,2-Dichloroethene	1.5	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Ethyl- benzene	34	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Isopropylbenzene	2.3	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methylene chloride	7.6	=	µg/L	2	5
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Propylbenzene	3.8	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	sec-Butylbenzene	1.2	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Toluene	27	=	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,2-Dichloroethene	0.42	J	µg/L	0.15	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Vinyl chloride	2	=	µg/L	0.2	1.5
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, m,p-	84	=	µg/L	0.8	2
AOC_RDX-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, o-	14	=	µg/L	0.4	1
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.96
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	0.19
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Amino-4,6-dinitrotoluene	1.2	J	µg/L	0.12	0.19
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Nitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Amino-2,6-dinitrotoluene	4.4	J	µg/L	0.12	0.19
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Nitrotoluene	0.39	U	µg/L	0.39	0.96
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	DNX	0.24	U	µg/L	0.24	0.48
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	HMX	0.19	U	µg/L	0.19	0.39
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	MNX	0.28	U	µg/L	0.28	0.48
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Nitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	RDX	5.1	J	µg/L	0.39	0.39
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetryl	0.19	U	µg/L	0.19	0.23
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	TNX	0.24	U	µg/L	0.24	0.48
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Arsenic	56	=	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Barium	510	=	µg/L	1.8	2
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chromium	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Lead	2	U	µg/L	2	3
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Selenium	4	U	µg/L	4	5
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Naphthalene	10	=	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1-Trichloroethane	9.7	J	µg/L	1.6	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichloroethane	8	U	µg/L	8	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.1	J	µg/L	1.8	30
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethane	200	=	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethene	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trimethylbenzene	63	=	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloroethane	9.9	J	µg/L	1.3	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trimethylbenzene	16	=	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1-Chlorohexane	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Chlorotoluene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Hexanone	40	U	µg/L	40	50
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Isopropyltoluene	3.4	J	µg/L	2	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Acetone	200	=	µg/L	64	100
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Benzene	82	=	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromobenzene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromochloromethane	2	U	µg/L	2	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromodichloromethane	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromoform	10	U	µg/L	10	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromomethane	8	U	µg/L	8	20
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon disulfide	8	U	µg/L	8	20
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon tetrachloride	4	U	µg/L	4	20
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloro methane	8	U	µg/L	8	20
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chlorobenzene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroethane	690	=	µg/L	16	20
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroform	1.9	U	µg/L	1.6	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,2-Dichloroethene	3	J	µg/L	1.5	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromochloromethane	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromomethane	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dichlorodifluoromethane	8	U	µg/L	8	20
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Ethyl- benzene	66	=	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Isopropylbenzene	3.9	J	µg/L	1.9	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl ethyl ketone	44	J	µg/L	20	60
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl isobutyl ketone	110	=	µg/L	32	50
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methylene chloride	59	=	µg/L	20	50
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Butylbenzene	1.7	J	µg/L	1.4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Propylbenzene	5.7	J	µg/L	1.6	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	p-Chlorotoluene	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	sec-Butylbenzene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Styrene	8	U	µg/L	8	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	tert-Butylbenzene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetrachloroethene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Toluene	1400	=	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichloroethene	4	U	µg/L	4	10
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Vinyl chloride	2	U	µg/L	2	15
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, m,p-	270	=	µg/L	8	20
AOC_RDX-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, o-	86	=	µg/L	4	10
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Barium	230	=	µg/L	1.8	2

ATTACHMENT 2
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Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Lead	2	U	µg/L	2	3
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethane	3.1	J	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trimethylbenzene	0.33	J	µg/L	0.15	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Benzene	4.9	J	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroethane	2.5	J	µg/L	1.6	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,2-Dichloroethene	1	J	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Ethyl- benzene	1.4	J	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Propylbenzene	0.22	J	µg/L	0.16	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Toluene	0.18	J	µg/L	0.17	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Vinyl chloride	0.24	J	µg/L	0.1	1.5
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, m,p-	0.19	J	µg/L	0.15	2
AOC_RDX-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Arsenic	46	J	µg/L	20	50
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Barium	2000	=	µg/L	9	10
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Cadmium	2	U	µg/L	2	2.5
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chromium	40	U	µg/L	40	50
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Lead	10	U	µg/L	10	15
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Mercury	0.75	U	µg/L	0.75	1
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Selenium	20	U	µg/L	20	25
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Silver	9	U	µg/L	9	10
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Naphthalene	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	16	U	µg/L	16	120
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	230	=	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	42	=	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	34	J	µg/L	6	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	33	J	µg/L	5.2	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	9.9	J	µg/L	6.4	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1-Chlorohexane	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Chlorotoluene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Hexanone	160	U	µg/L	160	200
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Acetone	6700	=	µg/L	260	400
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Benzene	46	=	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromochloromethane	8	U	µg/L	8	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromodichloromethane	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromoform	40	U	µg/L	40	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromomethane	32	UJ	µg/L	32	80
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon disulfide	32	U	µg/L	32	80
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon tetrachloride	16	U	µg/L	16	80

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloro methane	32	U	µg/L	32	80
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chlorobenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroethane	130	=	µg/L	64	80
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroform	6.6	U	µg/L	6.4	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	230	=	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromochloromethane	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromomethane	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	32	U	µg/L	32	80
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Ethyl- benzene	40	=	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Isopropylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	5100	=	µg/L	160	240
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	1700	=	µg/L	130	200
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methylene chloride	160	J	µg/L	38	200
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Butylbenzene	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Propylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	p-Chlorotoluene	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	sec-Butylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Styrene	32	U	µg/L	32	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	tert-Butylbenzene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Tetrachloroethene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Toluene	1900	=	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichloroethene	59	=	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Vinyl chloride	53	J	µg/L	4	60
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, m,p-	150	=	µg/L	32	80
AOC_RDX-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, o-	59	=	µg/L	16	40
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Arsenic	26	=	µg/L	8	10
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Barium	350	=	µg/L	1.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Lead	2	U	µg/L	2	3
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Selenium	4	U	µg/L	4	5
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Naphthalene	3.7	=	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichlorobenzene	0.41	J	µg/L	0.15	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1-Trichloroethane	0.24	J	µg/L	0.16	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethane	24	=	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trimethylbenzene	25	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloropropane	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3,5-Trimethylbenzene	4.7	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Hexanone	4	U	µg/L	4	5
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	4-Isopropyltoluene	0.49	J	µg/L	0.2	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Acetone	6.4	U	µg/L	6.4	10
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Benzene	45	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromoform	1	U	µg/L	1	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromomethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloro methane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroethane	250	=	µg/L	8	10
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroform	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,2-Dichloroethene	1.5	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Ethyl- benzene	34	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Isopropylbenzene	2.3	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methylene chloride	7.6	=	µg/L	2	5
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Propylbenzene	3.8	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	sec-Butylbenzene	1.2	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Styrene	0.8	U	µg/L	0.8	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Toluene	27	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,2-Dichloroethene	0.42	J	µg/L	0.15	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Vinyl chloride	2	=	µg/L	0.2	1.5
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, m,p-	84	=	µg/L	0.8	2
AOC_RDX-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, o-	14	=	µg/L	0.4	1
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.96
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	0.19
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Amino-4,6-dinitrotoluene	1.2	J	µg/L	0.12	0.19
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Nitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Amino-2,6-dinitrotoluene	4.4	J	µg/L	0.12	0.19
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Nitrotoluene	0.39	U	µg/L	0.39	0.96
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	DNX	0.24	U	µg/L	0.24	0.48
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	HMX	0.19	U	µg/L	0.19	0.39
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	MNX	0.28	U	µg/L	0.28	0.48

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Nitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	RDX	5.1	J	µg/L	0.39	0.39
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetryl	0.19	U	µg/L	0.19	0.23
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	TNX	0.24	U	µg/L	0.24	0.48
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Arsenic	56	=	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Barium	510	=	µg/L	1.8	2
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chromium	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Lead	2	U	µg/L	2	3
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Mercury	0.15	U	µg/L	0.15	0.2
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Selenium	4	U	µg/L	4	5
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Silver	1.8	U	µg/L	1.8	2
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Naphthalene	10	=	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1-Trichloroethane	9.7	J	µg/L	1.6	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.1	J	µg/L	1.8	30
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethane	200	=	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethene	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trimethylbenzene	63	=	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloroethane	9.9	J	µg/L	1.3	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trimethylbenzene	16	=	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1-Chlorohexane	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Chlorotoluene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Hexanone	40	U	µg/L	40	50
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Isopropyltoluene	3.4	J	µg/L	2	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Acetone	200	=	µg/L	64	100
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Benzene	82	=	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromochloromethane	2	U	µg/L	2	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromodichloromethane	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromoform	10	U	µg/L	10	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromomethane	8	U	µg/L	8	20
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon disulfide	8	U	µg/L	8	20
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon tetrachloride	4	U	µg/L	4	20
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloro methane	8	U	µg/L	8	20
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chlorobenzene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroethane	690	=	µg/L	16	20
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroform	1.9	U	µg/L	1.6	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,2-Dichloroethene	3	J	µg/L	1.5	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromochloromethane	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromomethane	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dichlorodifluoromethane	8	U	µg/L	8	20
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Ethyl- benzene	66	=	µg/L	4	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Isopropylbenzene	3.9	J	µg/L	1.9	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl ethyl ketone	44	J	µg/L	20	60
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl isobutyl ketone	110	=	µg/L	32	50
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methylene chloride	59	=	µg/L	20	50
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Butylbenzene	1.7	J	µg/L	1.4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Propylbenzene	5.7	J	µg/L	1.6	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	p-Chlorotoluene	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	sec-Butylbenzene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Styrene	8	U	µg/L	8	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	tert-Butylbenzene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetrachloroethene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Toluene	1400	=	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichloroethene	4	U	µg/L	4	10
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Vinyl chloride	2	U	µg/L	2	15
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, m,p-	270	=	µg/L	8	20
AOC_RDX-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, o-	86	=	µg/L	4	10
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Barium	230	=	µg/L	1.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Lead	2	U	µg/L	2	3
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethane	3.1	J	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trimethylbenzene	0.33	J	µg/L	0.15	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Benzene	4.9	J	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroethane	2.5	J	µg/L	1.6	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,2-Dichloroethene	1	J	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Ethyl- benzene	1.4	J	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Propylbenzene	0.22	J	µg/L	0.16	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Toluene	0.18	J	µg/L	0.17	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Vinyl chloride	0.24	J	µg/L	0.1	1.5
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, m,p-	0.19	J	µg/L	0.15	2
AOC_VOC-CW_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Arsenic	46	J	µg/L	20	50
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Barium	2000	=	µg/L	9	10
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Cadmium	2	U	µg/L	2	2.5
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chromium	40	U	µg/L	40	50
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Lead	10	U	µg/L	10	15
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Mercury	0.75	U	µg/L	0.75	1
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Selenium	20	U	µg/L	20	25
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Silver	9	U	µg/L	9	10
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Naphthalene	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	16	U	µg/L	16	120
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	230	=	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	42	=	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	32	U	µg/L	32	40

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	34	J	µg/L	6	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	33	J	µg/L	5.2	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	9.9	J	µg/L	6.4	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1-Chlorohexane	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Chlorotoluene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Hexanone	160	U	µg/L	160	200
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Acetone	6700	=	µg/L	260	400
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Benzene	46	=	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromobenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromochloromethane	8	U	µg/L	8	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromodichloromethane	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromoform	40	U	µg/L	40	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromomethane	32	UJ	µg/L	32	80
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon disulfide	32	U	µg/L	32	80
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon tetrachloride	16	U	µg/L	16	80
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloro methane	32	U	µg/L	32	80
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chlorobenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroethane	130	=	µg/L	64	80
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroform	6.6	U	µg/L	6.4	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	230	=	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromochloromethane	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromomethane	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	32	U	µg/L	32	80
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Ethyl- benzene	40	=	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Isopropylbenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	5100	=	µg/L	160	240
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	1700	=	µg/L	130	200
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methylene chloride	160	J	µg/L	38	200
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Butylbenzene	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Propylbenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	p-Chlorotoluene	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	sec-Butylbenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Styrene	32	U	µg/L	32	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	tert-Butylbenzene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Tetrachloroethene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Toluene	1900	=	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichloroethene	59	=	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Vinyl chloride	53	J	µg/L	4	60
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, m,p-	150	=	µg/L	32	80
AOC_VOC-CW_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, o-	59	=	µg/L	16	40
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Arsenic	17	=	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Barium	310	=	µg/L	1.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Lead	2	U	µg/L	2	3
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Selenium	4	U	µg/L	4	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Naphthalene	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	2000	=	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	40	U	µg/L	40	300
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	4900	=	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	270	=	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	80	U	µg/L	80	300
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	110	=	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	160	U	µg/L	160	500
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	81	J	µg/L	13	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	34	J	µg/L	16	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	20	U	µg/L	20	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1-Chlorohexane	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2-Chlorotoluene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2-Hexanone	400	U	µg/L	400	500
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Acetone	640	U	µg/L	640	1000
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Benzene	88	J	µg/L	16	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromobenzene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromochloromethane	20	U	µg/L	20	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromodichloromethane	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromoform	100	U	µg/L	100	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromomethane	80	U	µg/L	80	200
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Carbon disulfide	26	J	µg/L	17	200
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Carbon tetrachloride	40	U	µg/L	40	200
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloro methane	80	U	µg/L	80	200
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chlorobenzene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloroethane	1100	=	µg/L	160	200
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloroform	20	U	µg/L	16	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	2000	=	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dibromochloromethane	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dibromomethane	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	80	U	µg/L	80	200
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Ethyl- benzene	130	=	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Isopropylbenzene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	400	U	µg/L	400	600
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	320	U	µg/L	320	500
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	80	U	µg/L	80	500
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methylene chloride	200	U	µg/L	200	500
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	N-Butylbenzene	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	N-Propylbenzene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	p-Chlorotoluene	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	sec-Butylbenzene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Styrene	80	U	µg/L	80	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	tert-Butylbenzene	40	U	µg/L	40	100

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Tetrachloroethene	59	J	µg/L	20	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Toluene	3500	=	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Trichloroethene	40	U	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	80	U	µg/L	80	200
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Vinyl chloride	510	=	µg/L	20	150
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Xylene, m,p-	570	=	µg/L	80	200
AOC_VOC-CW_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Xylene, o-	210	=	µg/L	40	100
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Arsenic	26	=	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Barium	350	=	µg/L	1.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chromium	8	U	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Lead	2	U	µg/L	2	3
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Selenium	4	U	µg/L	4	5
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Naphthalene	3.7	=	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichlorobenzene	0.41	J	µg/L	0.15	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1-Trichloroethane	0.24	J	µg/L	0.16	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethane	24	=	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trimethylbenzene	25	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3,5-Trimethylbenzene	4.7	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	4-Isopropyltoluene	0.49	J	µg/L	0.2	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Benzene	45	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromoform	1	U	µg/L	1	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromomethane	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroethane	250	=	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,2-Dichloroethene	1.5	=	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Ethyl- benzene	34	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Isopropylbenzene	2.3	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methylene chloride	7.6	=	µg/L	2	5
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Propylbenzene	3.8	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	sec-Butylbenzene	1.2	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Toluene	27	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,2-Dichloroethene	0.42	J	µg/L	0.15	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Vinyl chloride	2	=	µg/L	0.2	1.5
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, m,p-	84	=	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, o-	14	=	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	DNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	HMX	0.45	J	µg/L	0.2	0.4
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	MNX	0.29	U	µg/L	0.29	0.5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	RDX	0.4	U	µg/L	0.4	0.4
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	TNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Barium	340	=	µg/L	1.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Lead	2	U	µg/L	2	3
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	0.71	J	µg/L	0.22	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Benzene	0.98	J	µg/L	0.16	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Ethyl- benzene	0.31	J	µg/L	0.16	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	sec-Butylbenzene	0.17	J	µg/L	0.17	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Arsenic	8	U	µg/L	8	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Barium	93	J	µg/L	1.8	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Lead	2	U	µg/L	2	3
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,1-Trichloroethane	0.5	J	µg/L	0.16	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloroethene	1.4	J	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methylene chloride	2	UJ	µg/L	2	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Tetrachloroethene	0.38	J	µg/L	0.2	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,1-Trichloroethane	88	=	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2-Trichloroethane	0.64	J	µg/L	0.27	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloroethane	18	=	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloroethene	83	=	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichloroethane	1.7	=	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromoform	1	U	µg/L	1	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromomethane	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloroform	0.79	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	cis-1,2-Dichloroethene	37	=	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dibromochloromethane	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Tetrachloroethene	24	=	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Trichloroethene	82	=	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	DNX	0.26	U	µg/L	0.26	0.51
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	HMX	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	MNX	0.3	U	µg/L	0.3	0.51
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	RDX	0.41	U	µg/L	0.41	0.41
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	TNX	0.26	U	µg/L	0.26	0.51
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Arsenic	8	U	µg/L	8	10
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Barium	260	J	µg/L	1.8	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chromium	8	U	µg/L	8	10
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Lead	2	U	µg/L	2	3
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Selenium	4	U	µg/L	4	5
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,1-Trichloroethane	7.5	J	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.64	J	µg/L	0.18	3

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloroethane	6.5	J	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloroethene	39	J	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichloroethane	1.6	J	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloroform	0.35	J	µg/L	0.16	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	cis-1,2-Dichloroethene	6.3	J	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Tetrachloroethene	0.81	J	µg/L	0.2	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Trichloroethene	2.8	J	µg/L	0.4	1
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-CW_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.96
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	0.19
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Amino-4,6-dinitrotoluene	1.2	J	µg/L	0.12	0.19
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Nitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Amino-2,6-dinitrotoluene	4.4	J	µg/L	0.12	0.19
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Nitrotoluene	0.39	U	µg/L	0.39	0.96
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	DNX	0.24	U	µg/L	0.24	0.48
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	HMX	0.19	U	µg/L	0.19	0.39
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	MNX	0.28	U	µg/L	0.28	0.48
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Nitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	RDX	5.1	J	µg/L	0.39	0.39
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetryl	0.19	U	µg/L	0.19	0.23
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	TNX	0.24	U	µg/L	0.24	0.48
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Arsenic	56	=	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Barium	510	=	µg/L	1.8	2
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chromium	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Lead	2	U	µg/L	2	3
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Selenium	4	U	µg/L	4	5
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Naphthalene	10	=	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1-Trichloroethane	9.7	J	µg/L	1.6	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.1	J	µg/L	1.8	30
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethane	200	=	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethene	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trimethylbenzene	63	=	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloroethane	9.9	J	µg/L	1.3	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trimethylbenzene	16	=	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1-Chlorohexane	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Chlorotoluene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Hexanone	40	U	µg/L	40	50
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Isopropyltoluene	3.4	J	µg/L	2	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Acetone	200	=	µg/L	64	100
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Benzene	82	=	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromobenzene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromochloromethane	2	U	µg/L	2	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromodichloromethane	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromoform	10	U	µg/L	10	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromomethane	8	U	µg/L	8	20
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon disulfide	8	U	µg/L	8	20
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon tetrachloride	4	U	µg/L	4	20

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloro methane	8	U	µg/L	8	20
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chlorobenzene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroethane	690	=	µg/L	16	20
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroform	1.9	U	µg/L	1.6	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,2-Dichloroethene	3	J	µg/L	1.5	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromochloromethane	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromomethane	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dichlorodifluoromethane	8	U	µg/L	8	20
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Ethyl- benzene	66	=	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Isopropylbenzene	3.9	J	µg/L	1.9	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl ethyl ketone	44	J	µg/L	20	60
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl isobutyl ketone	110	=	µg/L	32	50
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methylene chloride	59	=	µg/L	20	50
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Butylbenzene	1.7	J	µg/L	1.4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Propylbenzene	5.7	J	µg/L	1.6	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	p-Chlorotoluene	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	sec-Butylbenzene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Styrene	8	U	µg/L	8	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	tert-Butylbenzene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetrachloroethene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Toluene	1400	=	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichloroethene	4	U	µg/L	4	10
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Vinyl chloride	2	U	µg/L	2	15
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, m,p-	270	=	µg/L	8	20
AOC_VOC-CW_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, o-	86	=	µg/L	4	10
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Barium	230	=	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethane	3.1	J	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2,4-Trimethylbenzene	0.33	J	µg/L	0.15	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Benzene	4.9	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroethane	2.5	J	µg/L	1.6	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,2-Dichloroethene	1	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Ethyl- benzene	1.4	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	N-Propylbenzene	0.22	J	µg/L	0.16	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Toluene	0.18	J	µg/L	0.17	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Vinyl chloride	0.24	J	µg/L	0.1	1.5
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, m,p-	0.19	J	µg/L	0.15	2
AOC_VOC-Plume_FTA	FTA-TT-MW-01	FTA-TT-MW-01-0319	WG	3/23/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Arsenic	46	J	µg/L	20	50
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Barium	2000	=	µg/L	9	10
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Cadmium	2	U	µg/L	2	2.5
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chromium	40	U	µg/L	40	50
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Lead	10	U	µg/L	10	15
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Mercury	0.75	U	µg/L	0.75	1
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Selenium	20	U	µg/L	20	25
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Silver	9	U	µg/L	9	10
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Naphthalene	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	16	U	µg/L	16	40

ATTACHMENT 2

Analytical Data Used in the HHRA

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	16	U	µg/L	16	120
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	230	=	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	42	=	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	32	U	µg/L	32	120
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	34	J	µg/L	6	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	64	U	µg/L	64	200
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	33	J	µg/L	5.2	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	9.9	J	µg/L	6.4	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	8	U	µg/L	8	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	1-Chlorohexane	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Chlorotoluene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	2-Hexanone	160	U	µg/L	160	200
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Acetone	6700	=	µg/L	260	400
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Benzene	46	=	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromobenzene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromochloromethane	8	U	µg/L	8	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromodichloromethane	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromoform	40	U	µg/L	40	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Bromomethane	32	UJ	µg/L	32	80
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon disulfide	32	U	µg/L	32	80
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Carbon tetrachloride	16	U	µg/L	16	80
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloro methane	32	U	µg/L	32	80
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chlorobenzene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroethane	130	=	µg/L	64	80
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Chloroform	6.6	U	µg/L	6.4	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	230	=	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromochloromethane	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dibromomethane	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	32	U	µg/L	32	80
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Ethyl- benzene	40	=	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Isopropylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	5100	=	µg/L	160	240
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	1700	=	µg/L	130	200
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	32	U	µg/L	32	200
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Methylene chloride	160	J	µg/L	38	200
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Butylbenzene	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	N-Propylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	p-Chlorotoluene	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	sec-Butylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Styrene	32	U	µg/L	32	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	tert-Butylbenzene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Tetrachloroethene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Toluene	1900	=	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	16	U	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichloroethene	59	=	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	32	U	µg/L	32	80

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Vinyl chloride	53	J	µg/L	4	60
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, m,p-	150	=	µg/L	32	80
AOC_VOC-Plume_FTA	FTA-TT-MW-02	FTA-TT-MW-02-0319	WG	3/21/2019	5	30	Xylene, o-	59	=	µg/L	16	40
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Arsenic	17	=	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Barium	310	=	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Naphthalene	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	2000	=	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	40	U	µg/L	40	300
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	4900	=	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	270	=	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	80	U	µg/L	80	300
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	110	=	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	160	U	µg/L	160	500
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	81	J	µg/L	13	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	34	J	µg/L	16	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	20	U	µg/L	20	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	1-Chlorohexane	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2-Chlorotoluene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	2-Hexanone	400	U	µg/L	400	500
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Acetone	640	U	µg/L	640	1000
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Benzene	88	J	µg/L	16	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromobenzene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromochloromethane	20	U	µg/L	20	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromodichloromethane	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromoform	100	U	µg/L	100	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Bromomethane	80	U	µg/L	80	200
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Carbon disulfide	26	J	µg/L	17	200
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Carbon tetrachloride	40	U	µg/L	40	200
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloro methane	80	U	µg/L	80	200
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chlorobenzene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloroethane	1100	=	µg/L	160	200
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Chloroform	20	U	µg/L	16	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	2000	=	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dibromochloromethane	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dibromomethane	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	80	U	µg/L	80	200
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Ethyl- benzene	130	=	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Isopropylbenzene	40	U	µg/L	40	100

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	400	U	µg/L	400	600
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	320	U	µg/L	320	500
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	80	U	µg/L	80	500
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Methylene chloride	200	U	µg/L	200	500
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	N-Butylbenzene	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	N-Propylbenzene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	p-Chlorotoluene	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	sec-Butylbenzene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Styrene	80	U	µg/L	80	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	tert-Butylbenzene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Tetrachloroethene	59	J	µg/L	20	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Toluene	3500	=	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Trichloroethene	40	U	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	80	U	µg/L	80	200
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Vinyl chloride	510	=	µg/L	20	150
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Xylene, m,p-	570	=	µg/L	80	200
AOC_VOC-Plume_FTA	FTA-TT-MW-03	FTA-TT-MW-03-0319	WG	3/21/2019	5	30	Xylene, o-	210	=	µg/L	40	100
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Arsenic	26	=	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Barium	350	=	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Naphthalene	3.7	=	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichlorobenzene	0.41	J	µg/L	0.15	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,1-Trichloroethane	0.24	J	µg/L	0.16	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethane	24	=	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2,4-Trimethylbenzene	25	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3,5-Trimethylbenzene	4.7	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	4-Isopropyltoluene	0.49	J	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Benzene	45	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromochloromethane	0.2	U	µg/L	0.2	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromoform	1	U	µg/L	1	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Bromomethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroethane	250	=	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,2-Dichloroethene	1.5	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Ethyl- benzene	34	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Isopropylbenzene	2.3	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Methylene chloride	7.6	=	µg/L	2	5
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	N-Propylbenzene	3.8	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	sec-Butylbenzene	1.2	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Toluene	27	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,2-Dichloroethene	0.42	J	µg/L	0.15	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Vinyl chloride	2	=	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, m,p-	84	=	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-04	FTA-TT-MW-04-0319	WG	3/21/2019	7	32	Xylene, o-	14	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3,5-Trinitrobenzene	0.4	U	µg/L	0.4	0.99
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,4,6-Trinitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Nitrotoluene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	3-Nitrotoluene	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Nitrotoluene	0.4	U	µg/L	0.4	0.99
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	DNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	HMX	0.45	J	µg/L	0.2	0.4
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	MNX	0.29	U	µg/L	0.29	0.5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Nitrobenzene	0.2	U	µg/L	0.2	0.4
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	RDX	0.4	U	µg/L	0.4	0.4
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Tetryl	0.2	U	µg/L	0.2	0.24
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	TNX	0.25	U	µg/L	0.25	0.5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Barium	340	=	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Selenium	4	U	µg/L	4	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloroethane	0.71	J	µg/L	0.22	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Benzene	0.98	J	µg/L	0.16	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Ethyl- benzene	0.31	J	µg/L	0.16	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	sec-Butylbenzene	0.17	J	µg/L	0.17	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTA-TT-MW-05	FTA-TT-MW-05-0319	WG	3/21/2019	5	30	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.97
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	0.19
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.19
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2-Nitrotoluene	0.19	UJ	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	3-Nitrotoluene	0.39	UJ	µg/L	0.39	0.39
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.19
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	4-Nitrotoluene	0.39	UJ	µg/L	0.39	0.97
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	DNX	0.24	U	µg/L	0.24	0.49
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	HMX	0.19	U	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	MNX	0.28	U	µg/L	0.28	0.49
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Nitrobenzene	0.19	UJ	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	RDX	0.39	U	µg/L	0.39	0.39
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Tetryl	0.19	U	µg/L	0.19	0.23
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	TNX	0.24	U	µg/L	0.24	0.49
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Barium	42	=	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,1-Trichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1-Dichloroethene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Tetrachloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW4	FTP-MW4-0319	WG	3/21/2019	49.1	59.1	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,1-Trichloroethane	23	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,2-Trichloroethane	0.4	J	µg/L	0.27	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1-Dichloroethane	0.72	J	µg/L	0.22	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1-Dichloroethene	55	J	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Tetrachloroethene	0.64	J	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW5	FTP-MW5-R0319	WG	3/23/2019	8.9	13.9	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,1-Trichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,2-Trichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.21	U	µg/L	0.18	3
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1-Dichloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1-Dichloroethene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dichloroethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromoform	1	U	µg/L	1	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Bromomethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Chloroform	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	cis-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Tetrachloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Trichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	FTP-MW6	FTP-MW6-R0319	WG	3/24/2019	34.8	44.8	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Arsenic	8	U	µg/L	8	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Barium	93	J	µg/L	1.8	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,1-Trichloroethane	0.5	J	µg/L	0.16	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	UJ	µg/L	0.4	3
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloroethene	1.4	J	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichloroethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Chloroform	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	cis-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Methylene chloride	2	UJ	µg/L	2	5

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Tetrachloroethene	0.38	J	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Trichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-58	JAW-58-0319	WG	3/9/2019	10	20	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3-Dinitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2,4-Dinitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2,6-Dinitrotoluene	0.21	U	µg/L	0.21	0.21
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2-Nitrotoluene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.21
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	DNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	HMX	0.24	J	µg/L	0.09	0.41
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	MNX	0.3	U	µg/L	0.3	0.52
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Nitrobenzene	0.21	U	µg/L	0.21	0.41
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	RDX	1.4	=	µg/L	0.41	0.41
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Tetryl	0.21	U	µg/L	0.21	0.25
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	TNX	0.26	U	µg/L	0.26	0.52
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Barium	160	J	µg/L	1.8	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,1-Trichloroethane	32	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,2-Trichloroethane	1.3	=	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1-Dichloroethane	3.9	=	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1-Dichloroethene	110	J	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dibromoethane	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dichloroethane	0.82	J	µg/L	0.13	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Chloroform	0.19	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	cis-1,2-Dichloroethene	1.5	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	N-Propylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Tetrachloroethene	7	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Trichloroethene	0.29	J	µg/L	0.16	1
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-59	JAW-59-0319	WG	3/9/2019	23	33	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Barium	280	=	µg/L	1.8	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,1-Trichloroethane	12	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,2-Trichloroethane	2.5	J	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.56	J	µg/L	0.18	3
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1-Dichloroethane	140	J	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1-Dichloroethene	210	J	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dichloroethane	30	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Benzene	0.87	J	µg/L	0.16	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chloroethane	5.8	J	µg/L	1.6	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Chloroform	1.8	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	cis-1,2-Dichloroethene	190	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Tetrachloroethene	1.9	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	trans-1,2-Dichloroethene	0.58	J	µg/L	0.15	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Trichloroethene	37	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Vinyl chloride	1.3	J	µg/L	0.1	1.5
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-60	JAW-60-0319	WG	3/21/2019	24	34	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Naphthalene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,4-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,4-Dichlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Hexachlorobutadiene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,1,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,1-Trichloroethane	88	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2,2-Tetrachloroethane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2-Trichloroethane	0.64	J	µg/L	0.27	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	U	µg/L	0.4	3
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloroethane	18	=	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloroethene	83	=	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,1-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,3-Trichlorobenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,3-Trichloropropane	0.8	U	µg/L	0.8	3
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2,4-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dibromo-3-chloropropane	1.6	U	µg/L	1.6	5
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dibromoethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichloroethane	1.7	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,2-Dichloropropane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3,5-Trimethylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1,3-Dichloropropane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	1-Chlorohexane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2,2-Dichloropropane	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2-Chlorotoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	2-Hexanone	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	4-Isopropyltoluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Acetone	6.4	U	µg/L	6.4	10
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromochloromethane	0.2	U	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromodichloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromoform	1	U	µg/L	1	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Bromomethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Carbon disulfide	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Carbon tetrachloride	0.4	U	µg/L	0.4	2
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloro methane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chlorobenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloroethane	1.6	U	µg/L	1.6	2
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Chloroform	0.79	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	cis-1,2-Dichloroethene	37	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	cis-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dibromochloromethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dibromomethane	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Dichlorodifluoromethane	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Ethyl- benzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Isopropylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl ethyl ketone	4	U	µg/L	4	6
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl isobutyl ketone	3.2	U	µg/L	3.2	5
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methyl tert-butyl ether (MTBE)	0.8	U	µg/L	0.8	5
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Methylene chloride	2	U	µg/L	2	5
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	N-Butylbenzene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	N-Propylbenzene	0.4	U	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	p-Chlorotoluene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	sec-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Styrene	0.8	U	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	tert-Butylbenzene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Tetrachloroethene	24	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Toluene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	trans-1,2-Dichloroethene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	trans-1,3-Dichloropropene	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Trichloroethene	82	=	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Trichlorofluoromethane (Freon 11)	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Vinyl chloride	0.2	U	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Xylene, m,p-	0.8	U	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-61	JAW-61-0319	WG	3/21/2019	8	18	Xylene, o-	0.4	U	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3,5-Trinitrobenzene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dinitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,4,6-Trinitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,4-Dinitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,6-Dinitrotoluene	0.2	U	µg/L	0.2	0.2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Amino-4,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Nitrotoluene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	3-Nitrotoluene	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Amino-2,6-dinitrotoluene	0.12	U	µg/L	0.12	0.2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Nitrotoluene	0.41	U	µg/L	0.41	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	DNX	0.26	U	µg/L	0.26	0.51
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	HMX	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	MNX	0.3	U	µg/L	0.3	0.51
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Nitrobenzene	0.2	U	µg/L	0.2	0.41
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	RDX	0.41	U	µg/L	0.41	0.41
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Tetryl	0.2	U	µg/L	0.2	0.25
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	TNX	0.26	U	µg/L	0.26	0.51
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Arsenic	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Barium	260	J	µg/L	1.8	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Naphthalene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,4-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,4-Dichlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Hexachlorobutadiene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,1,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,1-Trichloroethane	7.5	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2,2-Tetrachloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2-Trichloroethane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.64	J	µg/L	0.18	3
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloroethane	6.5	J	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloroethene	39	J	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,1-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,3-Trichlorobenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,3-Trichloropropane	0.8	UJ	µg/L	0.8	3
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2,4-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dibromo-3-chloropropane	1.6	UJ	µg/L	1.6	5
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dibromoethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichloroethane	1.6	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,2-Dichloropropane	0.4	UJ	µg/L	0.4	1

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3,5-Trimethylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1,3-Dichloropropane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	1-Chlorohexane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2,2-Dichloropropane	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Chlorotoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	2-Hexanone	4	UJ	µg/L	4	5
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	4-Isopropyltoluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Acetone	6.4	UJ	µg/L	6.4	10
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromochloromethane	0.2	UJ	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromodichloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromoform	1	UJ	µg/L	1	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Bromomethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Carbon disulfide	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Carbon tetrachloride	0.4	UJ	µg/L	0.4	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloro methane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chlorobenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloroethane	1.6	UJ	µg/L	1.6	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Chloroform	0.35	J	µg/L	0.16	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	cis-1,2-Dichloroethene	6.3	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	cis-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dibromochloromethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dibromomethane	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Dichlorodifluoromethane	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Ethyl- benzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Isopropylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl ethyl ketone	4	UJ	µg/L	4	6
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl isobutyl ketone	3.2	UJ	µg/L	3.2	5
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methyl tert-butyl ether (MTBE)	0.8	UJ	µg/L	0.8	5
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Methylene chloride	2	UJ	µg/L	2	5
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	N-Butylbenzene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	N-Propylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	p-Chlorotoluene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	sec-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Styrene	0.8	UJ	µg/L	0.8	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	tert-Butylbenzene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Tetrachloroethene	0.81	J	µg/L	0.2	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Toluene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	trans-1,2-Dichloroethene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	trans-1,3-Dichloropropene	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Trichloroethene	2.8	J	µg/L	0.4	1
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Trichlorofluoromethane (Freon 11)	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Vinyl chloride	0.2	UJ	µg/L	0.2	1.5
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Xylene, m,p-	0.8	UJ	µg/L	0.8	2
AOC_VOC-Plume_FTA	JAW-80	JAW-80-0319	WG	3/9/2019	15	25	Xylene, o-	0.4	UJ	µg/L	0.4	1
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trinitrobenzene	0.39	U	µg/L	0.39	0.96
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dinitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4,6-Trinitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,4-Dinitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,6-Dinitrotoluene	0.19	U	µg/L	0.19	0.19
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Amino-4,6-dinitrotoluene	1.2	J	µg/L	0.12	0.19
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Nitrotoluene	0.19	U	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	3-Nitrotoluene	0.39	U	µg/L	0.39	0.39
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Amino-2,6-dinitrotoluene	4.4	J	µg/L	0.12	0.19
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Nitrotoluene	0.39	U	µg/L	0.39	0.96
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	DNX	0.24	U	µg/L	0.24	0.48
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	HMX	0.19	U	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	MNX	0.28	U	µg/L	0.28	0.48

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Nitrobenzene	0.19	U	µg/L	0.19	0.39
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	RDX	5.1	J	µg/L	0.39	0.39
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetryl	0.19	U	µg/L	0.19	0.23
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	TNX	0.24	U	µg/L	0.24	0.48
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Arsenic	56	=	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Barium	510	=	µg/L	1.8	2
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Cadmium	0.4	U	µg/L	0.4	0.5
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chromium	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Lead	2	U	µg/L	2	3
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Mercury	0.15	U	µg/L	0.15	0.2
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Selenium	4	U	µg/L	4	5
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Silver	1.8	U	µg/L	1.8	2
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Naphthalene	10	=	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trichlorobenzene	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichlorobenzene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichlorobenzene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,4-Dichlorobenzene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Hexachlorobutadiene	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,1-Trichloroethane	9.7	J	µg/L	1.6	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2,2-Tetrachloroethane	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichloroethane	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.1	J	µg/L	1.8	30
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethane	200	=	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloroethene	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,1-Dichloropropene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichlorobenzene	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,3-Trichloropropane	8	U	µg/L	8	30
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2,4-Trimethylbenzene	63	=	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromo-3-chloropropane	16	U	µg/L	16	50
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dibromoethane	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloroethane	9.9	J	µg/L	1.3	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,2-Dichloropropane	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3,5-Trimethylbenzene	16	=	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1,3-Dichloropropane	2	U	µg/L	2	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	1-Chlorohexane	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2,2-Dichloropropane	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Chlorotoluene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	2-Hexanone	40	U	µg/L	40	50
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	4-Isopropyltoluene	3.4	J	µg/L	2	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Acetone	200	=	µg/L	64	100
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Benzene	82	=	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromobenzene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromochloromethane	2	U	µg/L	2	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromodichloromethane	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromoform	10	U	µg/L	10	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Bromomethane	8	U	µg/L	8	20
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon disulfide	8	U	µg/L	8	20
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Carbon tetrachloride	4	U	µg/L	4	20
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloro methane	8	U	µg/L	8	20
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chlorobenzene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroethane	690	=	µg/L	16	20
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Chloroform	1.9	U	µg/L	1.6	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,2-Dichloroethene	3	J	µg/L	1.5	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	cis-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromochloromethane	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dibromomethane	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Dichlorodifluoromethane	8	U	µg/L	8	20
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Ethyl- benzene	66	=	µg/L	4	10

ATTACHMENT 2
Analytical Data Used in the HHRA
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Data Group ID for HHRA	StationID	Sample ID (1)	Matrix	Date Collected	Upper Depth	Lower Depth	Parameter Name	Result	Qualifier	Units	Detection Limit	Reporting Limit
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Isopropylbenzene	3.9	J	µg/L	1.9	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl ethyl ketone	44	J	µg/L	20	60
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl isobutyl ketone	110	=	µg/L	32	50
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methyl tert-butyl ether (MTBE)	8	U	µg/L	8	50
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Methylene chloride	59	=	µg/L	20	50
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Butylbenzene	1.7	J	µg/L	1.4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	N-Propylbenzene	5.7	J	µg/L	1.6	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	p-Chlorotoluene	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	sec-Butylbenzene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Styrene	8	U	µg/L	8	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	tert-Butylbenzene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Tetrachloroethene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Toluene	1400	=	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,2-Dichloroethene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	trans-1,3-Dichloropropene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichloroethene	4	U	µg/L	4	10
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Trichlorofluoromethane (Freon 11)	8	U	µg/L	8	20
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Vinyl chloride	2	U	µg/L	2	15
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, m,p-	270	=	µg/L	8	20
AOC_VOC-Plume_FTA	SA-99-1	SA-99-1-0319	WG	3/21/2019	18	23	Xylene, o-	86	=	µg/L	4	10

Notes:
(1) The data were reduced such that when a normal and duplicate sample were available, the highest detected concentration among normal or duplicate samples was used when a chemical was detected in any sample. If both results were non-detect, the lowest reported detection limit (i.e., reporting limit) was used.
NA = Not available
WG - groundwater
J - compound was detected below the reporting limit in the sample
= - detected
U - not detected
µg/L - microgram per liter

UCL Statistics for Data Sets with Non-Detects

1,1,1-Trichloroethane

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	3
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.24	Minimum Non-Detect	0.4
Maximum Detect	2000	Maximum Non-Detect	16
Variance Detects	653746	Percent Non-Detects	33.33%
Mean Detects	351	SD Detects	808.5
Median Detects	8.6	CV Detects	2.304
Skewness Detects	2.44	Kurtosis Detects	5.963
Mean of Logged Detects	2.374	SD of Logged Detects	3.339

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.526	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.461	Lilliefors GOF Test
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	234.4	KM Standard Error of Mean	228.1
KM SD	624.8	95% KM (BCA) UCL	676.6
95% KM (t) UCL	658.6	95% KM (Percentile Bootstrap) UCL	669.1
95% KM (z) UCL	609.7	95% KM Bootstrap t UCL	35021
90% KM Chebyshev UCL	918.8	95% KM Chebyshev UCL	1229
97.5% KM Chebyshev UCL	1659	99% KM Chebyshev UCL	2504

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.552	Anderson-Darling GOF Test
5% A-D Critical Value	0.798	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.296	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.21	k star (bias corrected MLE)	0.216
Theta hat (MLE)	1675	Theta star (bias corrected MLE)	1626
nu hat (MLE)	2.514	nu star (bias corrected)	2.591
Mean (detects)	351		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	234
Maximum	2000	Median	0.5
SD	662.9	CV	2.833
k hat (MLE)	0.143	k star (bias corrected MLE)	0.169
Theta hat (MLE)	1635	Theta star (bias corrected MLE)	1381
nu hat (MLE)	2.576	nu star (bias corrected)	3.051
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.05, α)	0.388	Adjusted Chi Square Value (3.05, β)	0.245
95% Gamma Approximate UCL (use when n>=50)	1842	95% Gamma Adjusted UCL (use when n<50)	2913

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	234.4	SD (KM)	624.8
Variance (KM)	390387	SE of Mean (KM)	228.1
k hat (KM)	0.141	k star (KM)	0.168
nu hat (KM)	2.533	nu star (KM)	3.022
theta hat (KM)	1666	theta star (KM)	1396
80% gamma percentile (KM)	277.8	90% gamma percentile (KM)	703.7
95% gamma percentile (KM)	1260	99% gamma percentile (KM)	2839

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.02, α)	0.379	Adjusted Chi Square Value (3.02, β)	0.239
95% Gamma Approximate KM-UCL (use when n>=50)	1869	95% Gamma Adjusted KM-UCL (use when n<50)	2958

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.179	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	234.1	Mean in Log Scale	0.987
SD in Original Scale	662.8	SD in Log Scale	3.462
95% t UCL (assumes normality of ROS data)	645	95% Percentile Bootstrap UCL	668.4
95% BCA Bootstrap UCL	899.6	95% Bootstrap t UCL	38220
95% H-UCL (Log ROS)	1.338E+8		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.253	KM Geo Mean	3.501
KM SD (logged)	3.021	95% Critical H Value (KM-Log)	8.406
KM Standard Error of Mean (logged)	1.123	95% H-UCL (KM -Log)	2662774

KM SD (logged)	3.021	95% Critical H Value (KM-Log)	8.406
KM Standard Error of Mean (logged)	1.123		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	234.9	Mean in Log Scale	1.456
SD in Original Scale	662.5	SD in Log Scale	3.162
95% t UCL (Assumes normality)	645.6	95% H-Stat UCL	11670640

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	35021	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	2958

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1-Dichloroethane

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Number of Detects	8	Number of Non-Detects	1
Number of Distinct Detects	8	Number of Distinct Non-Detects	1
Minimum Detect	0.71	Minimum Non-Detect	0.8
Maximum Detect	4900	Maximum Non-Detect	0.8
Variance Detects	2926099	Percent Non-Detects	11.11%
Mean Detects	672.8	SD Detects	1711
Median Detects	21	CV Detects	2.543
Skewness Detects	2.812	Kurtosis Detects	7.929
Mean of Logged Detects	3.495	SD of Logged Detects	2.815

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.46	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.477	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	598.1	KM Standard Error of Mean	542.8
KM SD	1523	95% KM (BCA) UCL	1667
95% KM (t) UCL	1608	95% KM (Percentile Bootstrap) UCL	1662
95% KM (z) UCL	1491	95% KM Bootstrap t UCL	14645
90% KM Chebyshev UCL	2227	95% KM Chebyshev UCL	2964
97.5% KM Chebyshev UCL	3988	99% KM Chebyshev UCL	5999

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.732	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.821	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.278	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.321	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.237	k star (bias corrected MLE)	0.232
Theta hat (MLE)	2833	Theta star (bias corrected MLE)	2903
nu hat (MLE)	3.799	nu star (bias corrected)	3.708
Mean (detects)	672.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	598
Maximum	4900	Median	18
SD	1616	CV	2.702
k hat (MLE)	0.195	k star (bias corrected MLE)	0.204
Theta hat (MLE)	3074	Theta star (bias corrected MLE)	2935
nu hat (MLE)	3.502	nu star (bias corrected)	3.668
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.67, α)	0.595	Adjusted Chi Square Value (3.67, β)	0.389
95% Gamma Approximate UCL (use when n>=50)	3686	95% Gamma Adjusted UCL (use when n<50)	5641

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	598.1	SD (KM)	1523
Variance (KM)	2320466	SE of Mean (KM)	542.8
k hat (KM)	0.154	k star (KM)	0.177
nu hat (KM)	2.775	nu star (KM)	3.183
theta hat (KM)	3880	theta star (KM)	3382
80% gamma percentile (KM)	733.9	90% gamma percentile (KM)	1802
95% gamma percentile (KM)	3177	99% gamma percentile (KM)	7044

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.18, α)	0.429	Adjusted Chi Square Value (3.18, β)	0.273
95% Gamma Approximate KM-UCL (use when n>=50)	4441	95% Gamma Adjusted KM-UCL (use when n<50)	6986

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	598.1	Mean in Log Scale	2.974
SD in Original Scale	1616	SD in Log Scale	3.062
95% t UCL (assumes normality of ROS data)	1600	95% Percentile Bootstrap UCL	1659
95% BCA Bootstrap UCL	2207	95% Bootstrap t UCL	14786
95% H-UCL (Log ROS)	21494397		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.069	KM Geo Mean	21.52
KM SD (logged)	2.76	95% Critical H Value (KM-Log)	7.71
KM Standard Error of Mean (logged)	0.983	95% H-UCL (KM -Log)	1794412
KM SD (logged)	2.76	95% Critical H Value (KM-Log)	7.71
KM Standard Error of Mean (logged)	0.983		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	598.1	Mean in Log Scale	3.005
SD in Original Scale	1616	SD in Log Scale	3.016
95% t UCL (Assumes normality)	1600	95% H-Stat UCL	14663236

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	14645	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	6986

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	1.4	Minimum Non-Detect	0.8
Maximum Detect	270	Maximum Non-Detect	8
Variance Detects	11290	Percent Non-Detects	44.44%
Mean Detects	87.08	SD Detects	106.3
Median Detects	42	CV Detects	1.22
Skewness Detects	1.837	Kurtosis Detects	3.6
Mean of Logged Detects	3.551	SD of Logged Detects	1.957

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.315	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	48.75	KM Standard Error of Mean	30.85
KM SD	82.79	95% KM (BCA) UCL	108.6
95% KM (t) UCL	106.1	95% KM (Percentile Bootstrap) UCL	99.82
95% KM (z) UCL	99.5	95% KM Bootstrap t UCL	194.8
90% KM Chebyshev UCL	141.3	95% KM Chebyshev UCL	183.2
97.5% KM Chebyshev UCL	241.4	99% KM Chebyshev UCL	355.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.284	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.703	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.241	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.368	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.665	k star (bias corrected MLE)	0.399
Theta hat (MLE)	131	Theta star (bias corrected MLE)	218.1
nu hat (MLE)	6.647	nu star (bias corrected)	3.992
Mean (detects)	87.08		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	48.38
Maximum	270	Median	1.4
SD	88.04	CV	1.82
k hat (MLE)	0.188	k star (bias corrected MLE)	0.199
Theta hat (MLE)	257.4	Theta star (bias corrected MLE)	242.7
nu hat (MLE)	3.383	nu star (bias corrected)	3.589
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.59, α)	0.566	Adjusted Chi Square Value (3.59, β)	0.368
95% Gamma Approximate UCL (use when n>=50)	306.6	95% Gamma Adjusted UCL (use when n<50)	471.5

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	48.75	SD (KM)	82.79
Variance (KM)	6854	SE of Mean (KM)	30.85
k hat (KM)	0.347	k star (KM)	0.305
nu hat (KM)	6.241	nu star (KM)	5.494
theta hat (KM)	140.6	theta star (KM)	159.7
80% gamma percentile (KM)	75.07	90% gamma percentile (KM)	143.5
95% gamma percentile (KM)	221.8	99% gamma percentile (KM)	424.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.49, α)	1.387	Adjusted Chi Square Value (5.49, β)	1.001
95% Gamma Approximate KM-UCL (use when n>=50)	193.1	95% Gamma Adjusted KM-UCL (use when n<50)	267.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.883	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.323	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	48.54	Mean in Log Scale	1.352
SD in Original Scale	87.94	SD in Log Scale	3.04
95% t UCL (assumes normality of ROS data)	103.1	95% Percentile Bootstrap UCL	103.3
95% BCA Bootstrap UCL	124.6	95% Bootstrap t UCL	209.1
95% H-UCL (Log ROS)	3467539		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.889	KM Geo Mean	6.614
KM SD (logged)	2.272	95% Critical H Value (KM-Log)	6.42
KM Standard Error of Mean (logged)	0.847	95% H-UCL (KM -Log)	15195
KM SD (logged)	2.272	95% Critical H Value (KM-Log)	6.42
KM Standard Error of Mean (logged)	0.847		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	48.96	Mean in Log Scale	1.821
SD in Original Scale	87.69	SD in Log Scale	2.573
95% t UCL (Assumes normality)	103.3	95% H-Stat UCL	119734

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 106.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,2,4-Trimethylbenzene

General Statistics

Total Number of Observations	9	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.33	Minimum Non-Detect	0.4
Maximum Detect	110	Maximum Non-Detect	0.4
Variance Detects	1764	Percent Non-Detects	44.44%
Mean Detects	46.47	SD Detects	42
Median Detects	34	CV Detects	0.904
Skewness Detects	0.849	Kurtosis Detects	0.494
Mean of Logged Detects	2.896	SD of Logged Detects	2.31

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.217	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	25.96	KM Standard Error of Mean	13.49
KM SD	36.19	95% KM (BCA) UCL	47.62
95% KM (t) UCL	51.04	95% KM (Percentile Bootstrap) UCL	46.85
95% KM (z) UCL	48.14	95% KM Bootstrap t UCL	59.17
90% KM Chebyshev UCL	66.42	95% KM Chebyshev UCL	84.74
97.5% KM Chebyshev UCL	110.2	99% KM Chebyshev UCL	160.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.407	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.703	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.292	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.369	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.648	k star (bias corrected MLE)	0.393
Theta hat (MLE)	71.69	Theta star (bias corrected MLE)	118.4
nu hat (MLE)	6.481	nu star (bias corrected)	3.926
Mean (detects)	46.47		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	26.36
Maximum	110	Median	4.916
SD	38.11	CV	1.446
k hat (MLE)	0.237	k star (bias corrected MLE)	0.232
Theta hat (MLE)	111.2	Theta star (bias corrected MLE)	113.6
nu hat (MLE)	4.268	nu star (bias corrected)	4.179
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (4.18, α)	0.794	Adjusted Chi Square Value (4.18, β)	0.535
95% Gamma Approximate UCL (use when n>=50)	138.8	95% Gamma Adjusted UCL (use when n<50)	205.8

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	25.96	SD (KM)	36.19
Variance (KM)	1309	SE of Mean (KM)	13.49
k hat (KM)	0.515	k star (KM)	0.417
nu hat (KM)	9.265	nu star (KM)	7.51
theta hat (KM)	50.44	theta star (KM)	62.22
80% gamma percentile (KM)	42.09	90% gamma percentile (KM)	72.77
95% gamma percentile (KM)	106.3	99% gamma percentile (KM)	190.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.51, α)	2.455	Adjusted Chi Square Value (7.51, β)	1.89
95% Gamma Approximate KM-UCL (use when n>=50)	79.43	95% Gamma Adjusted KM-UCL (use when n<50)	103.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.781	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.356	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	26.22	Mean in Log Scale	1.3
SD in Original Scale	38.19	SD in Log Scale	2.647
95% t UCL (assumes normality of ROS data)	49.89	95% Percentile Bootstrap UCL	47.78
95% BCA Bootstrap UCL	54.05	95% Bootstrap t UCL	73.21
95% H-UCL (Log ROS)	125390		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.116	KM Geo Mean	3.053
KM SD (logged)	2.516	95% Critical H Value (KM-Log)	7.064
KM Standard Error of Mean (logged)	0.938	95% H-UCL (KM -Log)	38838
KM SD (logged)	2.516	95% Critical H Value (KM-Log)	7.064
KM Standard Error of Mean (logged)	0.938		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	25.9	Mean in Log Scale	0.894
SD in Original Scale	38.42	SD in Log Scale	2.882
95% t UCL (Assumes normality)	49.72	95% H-Stat UCL	560056

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 51.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,2-Dichloroethane

General Statistics

Total Number of Observations	9	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	1.6	Minimum Non-Detect	0.4
Maximum Detect	81	Maximum Non-Detect	0.4
Variance Detects	1129	Percent Non-Detects	44.44%
Mean Detects	25.44	SD Detects	33.61
Median Detects	9.9	CV Detects	1.321
Skewness Detects	1.551	Kurtosis Detects	2.027
Mean of Logged Detects	2.237	SD of Logged Detects	1.752

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.805	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.278	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	14.31	KM Standard Error of Mean	9.551
KM SD	25.63	95% KM (BCA) UCL	29.18
95% KM (t) UCL	32.07	95% KM (Percentile Bootstrap) UCL	30.23
95% KM (z) UCL	30.02	95% KM Bootstrap t UCL	88.9
90% KM Chebyshev UCL	42.96	95% KM Chebyshev UCL	55.94
97.5% KM Chebyshev UCL	73.96	99% KM Chebyshev UCL	109.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.333	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.705	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.246	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.369	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.616	k star (bias corrected MLE)	0.38
Theta hat (MLE)	41.31	Theta star (bias corrected MLE)	67.01
nu hat (MLE)	6.158	nu star (bias corrected)	3.797
Mean (detects)	25.44		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	14.14
Maximum	81	Median	1.6
SD	27.28	CV	1.93
k hat (MLE)	0.211	k star (bias corrected MLE)	0.215
Theta hat (MLE)	66.91	Theta star (bias corrected MLE)	65.77
nu hat (MLE)	3.803	nu star (bias corrected)	3.869
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.87, α)	0.671	Adjusted Chi Square Value (3.87, β)	0.444
95% Gamma Approximate UCL (use when n>=50)	81.56	95% Gamma Adjusted UCL (use when n<50)	123.3

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	14.31	SD (KM)	25.63
Variance (KM)	656.8	SE of Mean (KM)	9.551
k hat (KM)	0.312	k star (KM)	0.282
nu hat (KM)	5.613	nu star (KM)	5.075
theta hat (KM)	45.89	theta star (KM)	50.75
80% gamma percentile (KM)	21.59	90% gamma percentile (KM)	42.5
95% gamma percentile (KM)	66.77	99% gamma percentile (KM)	130.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.08, α)	1.187	Adjusted Chi Square Value (5.08, β)	0.841
95% Gamma Approximate KM-UCL (use when n>=50)	61.18	95% Gamma Adjusted KM-UCL (use when n<50)	86.39

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.235	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	14.18	Mean in Log Scale	-0.06
SD in Original Scale	27.26	SD in Log Scale	3.127
95% t UCL (assumes normality of ROS data)	31.07	95% Percentile Bootstrap UCL	30.47
95% BCA Bootstrap UCL	36.41	95% Bootstrap t UCL	121.9
95% H-UCL (Log ROS)	1864660		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.835	KM Geo Mean	2.306
KM SD (logged)	1.954	95% Critical H Value (KM-Log)	5.59
KM Standard Error of Mean (logged)	0.728	95% H-UCL (KM -Log)	740.6
KM SD (logged)	1.954	95% Critical H Value (KM-Log)	5.59
KM Standard Error of Mean (logged)	0.728		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	14.22	Mean in Log Scale	0.527
SD in Original Scale	27.23	SD in Log Scale	2.376
95% t UCL (Assumes normality)	31.1	95% H-Stat UCL	7870

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	32.07

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Benzene

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
Number of Detects	6	Number of Non-Detects	3
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	0.98	Minimum Non-Detect	0.4
Maximum Detect	88	Maximum Non-Detect	0.4
Variance Detects	1353	Percent Non-Detects	33.33%
Mean Detects	44.48	SD Detects	36.78
Median Detects	45.5	CV Detects	0.827
Skewness Detects	-0.0547	Kurtosis Detects	-1.81
Mean of Logged Detects	3.015	SD of Logged Detects	1.823

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.892	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	29.79	KM Standard Error of Mean	12.56
KM SD	34.4	95% KM (BCA) UCL	48.93
95% KM (t) UCL	53.14	95% KM (Percentile Bootstrap) UCL	48.75
95% KM (z) UCL	50.45	95% KM Bootstrap t UCL	53.61
90% KM Chebyshev UCL	67.47	95% KM Chebyshev UCL	84.54
97.5% KM Chebyshev UCL	108.2	99% KM Chebyshev UCL	154.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.536	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.32	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.343	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.765	k star (bias corrected MLE)	0.494
Theta hat (MLE)	58.14	Theta star (bias corrected MLE)	90.1
nu hat (MLE)	9.181	nu star (bias corrected)	5.924
Mean (detects)	44.48		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	29.66
Maximum	88	Median	4.9
SD	36.6	CV	1.234
k hat (MLE)	0.245	k star (bias corrected MLE)	0.237
Theta hat (MLE)	121.3	Theta star (bias corrected MLE)	125.1
nu hat (MLE)	4.402	nu star (bias corrected)	4.268
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (4.27, α)	0.83	Adjusted Chi Square Value (4.27, β)	0.563
95% Gamma Approximate UCL (use when n>=50)	152.4	95% Gamma Adjusted UCL (use when n<50)	224.8

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	29.79	SD (KM)	34.4
Variance (KM)	1183	SE of Mean (KM)	12.56
k hat (KM)	0.75	k star (KM)	0.574
nu hat (KM)	13.5	nu star (KM)	10.33
theta hat (KM)	39.72	theta star (KM)	51.9
80% gamma percentile (KM)	49.09	90% gamma percentile (KM)	78.24
95% gamma percentile (KM)	108.9	99% gamma percentile (KM)	183.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.33, α)	4.15	Adjusted Chi Square Value (10.33, β)	3.364
95% Gamma Approximate KM-UCL (use when n>=50)	74.15	95% Gamma Adjusted KM-UCL (use when n<50)	91.47

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.818	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.335	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data Not Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	29.78	Mean in Log Scale	1.58
SD in Original Scale	36.49	SD in Log Scale	2.639
95% t UCL (assumes normality of ROS data)	52.4	95% Percentile Bootstrap UCL	48.56
95% BCA Bootstrap UCL	52.09	95% Bootstrap t UCL	64.23
95% H-UCL (Log ROS)	156328		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.704	KM Geo Mean	5.498
KM SD (logged)	2.298	95% Critical H Value (KM-Log)	6.487
KM Standard Error of Mean (logged)	0.839	95% H-UCL (KM -Log)	14974
KM SD (logged)	2.298	95% Critical H Value (KM-Log)	6.487
KM Standard Error of Mean (logged)	0.839		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	29.72	Mean in Log Scale	1.473
SD in Original Scale	36.55	SD in Log Scale	2.724
95% t UCL (Assumes normality)	52.37	95% H-Stat UCL	273485

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	53.14

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Ethyl- benzene

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
Number of Detects	6	Number of Non-Detects	3
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	0.31	Minimum Non-Detect	0.4
Maximum Detect	130	Maximum Non-Detect	0.4
Variance Detects	2342	Percent Non-Detects	33.33%
Mean Detects	45.29	SD Detects	48.39
Median Detects	37	CV Detects	1.069
Skewness Detects	1.164	Kurtosis Detects	1.345
Mean of Logged Detects	2.573	SD of Logged Detects	2.411

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.21	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	30.29	KM Standard Error of Mean	15.28
KM SD	41.84	95% KM (BCA) UCL	54.62
95% KM (t) UCL	58.7	95% KM (Percentile Bootstrap) UCL	55.49
95% KM (z) UCL	55.42	95% KM Bootstrap t UCL	75.8
90% KM Chebyshev UCL	76.13	95% KM Chebyshev UCL	96.89
97.5% KM Chebyshev UCL	125.7	99% KM Chebyshev UCL	182.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.391	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.278	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.348	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.511	k star (bias corrected MLE)	0.366
Theta hat (MLE)	88.69	Theta star (bias corrected MLE)	123.6
nu hat (MLE)	6.127	nu star (bias corrected)	4.397
Mean (detects)	45.29		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	30.19
Maximum	130	Median	1.4
SD	44.45	CV	1.472
k hat (MLE)	0.224	k star (bias corrected MLE)	0.223
Theta hat (MLE)	134.8	Theta star (bias corrected MLE)	135.2
nu hat (MLE)	4.032	nu star (bias corrected)	4.021
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (4.02, α)	0.73	Adjusted Chi Square Value (4.02, β)	0.488
95% Gamma Approximate UCL (use when n>=50)	166.3	95% Gamma Adjusted UCL (use when n<50)	248.9

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	30.29	SD (KM)	41.84
Variance (KM)	1751	SE of Mean (KM)	15.28
k hat (KM)	0.524	k star (KM)	0.424
nu hat (KM)	9.436	nu star (KM)	7.624
theta hat (KM)	57.79	theta star (KM)	71.52
80% gamma percentile (KM)	49.19	90% gamma percentile (KM)	84.68
95% gamma percentile (KM)	123.4	99% gamma percentile (KM)	220.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.62, α)	2.519	Adjusted Chi Square Value (7.62, β)	1.945
95% Gamma Approximate KM-UCL (use when n>=50)	91.68	95% Gamma Adjusted KM-UCL (use when n<50)	118.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	30.34	Mean in Log Scale	1.303
SD in Original Scale	44.34	SD in Log Scale	2.765
95% t UCL (assumes normality of ROS data)	57.83	95% Percentile Bootstrap UCL	55.3
95% BCA Bootstrap UCL	62.07	95% Bootstrap t UCL	76.25
95% H-UCL (Log ROS)	320856		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.325	KM Geo Mean	3.762
KM SD (logged)	2.519	95% Critical H Value (KM-Log)	7.07
KM Standard Error of Mean (logged)	0.92	95% H-UCL (KM -Log)	48646
KM SD (logged)	2.519	95% Critical H Value (KM-Log)	7.07
KM Standard Error of Mean (logged)	0.92		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	30.26	Mean in Log Scale	1.179
SD in Original Scale	44.41	SD in Log Scale	2.829
95% t UCL (Assumes normality)	57.78	95% H-Stat UCL	478189

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 58.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Tetrachloroethene

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
Number of Detects	4	Number of Non-Detects	5
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.38	Minimum Non-Detect	0.4
Maximum Detect	59	Maximum Non-Detect	16
Variance Detects	761.9	Percent Non-Detects	55.56%
Mean Detects	21.05	SD Detects	27.6
Median Detects	12.41	CV Detects	1.311
Skewness Detects	1.191	Kurtosis Detects	0.424
Mean of Logged Detects	1.519	SD of Logged Detects	2.482

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.854	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	9.585	KM Standard Error of Mean	7.294
KM SD	18.95	95% KM (BCA) UCL	N/A
95% KM (t) UCL	23.15	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	21.58	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	31.47	95% KM Chebyshev UCL	41.38
97.5% KM Chebyshev UCL	55.14	99% KM Chebyshev UCL	82.16

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.384	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.689	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.305	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.413	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.426	k star (bias corrected MLE)	0.273
Theta hat (MLE)	49.36	Theta star (bias corrected MLE)	77.02
nu hat (MLE)	3.411	nu star (bias corrected)	2.186
Mean (detects)	21.05		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.36
Maximum	59	Median	0.01
SD	20.22	CV	2.16
k hat (MLE)	0.181	k star (bias corrected MLE)	0.195
Theta hat (MLE)	51.61	Theta star (bias corrected MLE)	48.01
nu hat (MLE)	3.264	nu star (bias corrected)	3.51
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.51, α)	0.538	Adjusted Chi Square Value (3.51, β)	0.348
95% Gamma Approximate UCL (use when n>=50)	61.04	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9.585	SD (KM)	18.95
Variance (KM)	359.1	SE of Mean (KM)	7.294
k hat (KM)	0.256	k star (KM)	0.245
nu hat (KM)	4.605	nu star (KM)	4.403
theta hat (KM)	37.47	theta star (KM)	39.18
80% gamma percentile (KM)	13.81	90% gamma percentile (KM)	28.81
95% gamma percentile (KM)	46.69	99% gamma percentile (KM)	94.44

ATTACHMENT 3

ProUCL Output - Groundwater (VOC Plume Core), Trench/Culvert Scenario

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.40, α)	0.887	Adjusted Chi Square Value (4.40, β)	0.606
95% Gamma Approximate KM-UCL (use when n>=50)	47.57	95% Gamma Adjusted KM-UCL (use when n<50)	69.59

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.881	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.257	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	9.541	Mean in Log Scale	-0.0879
SD in Original Scale	20.12	SD in Log Scale	2.259
95% t UCL (assumes normality of ROS data)	22.01	95% Percentile Bootstrap UCL	19.97
95% BCA Bootstrap UCL	26.43	95% Bootstrap t UCL	798.8
95% H-UCL (Log ROS)	1933		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.171	KM Geo Mean	1.187
KM SD (logged)	1.879	95% Critical H Value (KM-Log)	5.394
KM Standard Error of Mean (logged)	0.726	95% H-UCL (KM -Log)	249.5
KM SD (logged)	1.879	95% Critical H Value (KM-Log)	5.394
KM Standard Error of Mean (logged)	0.726		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	10.53	Mean in Log Scale	0.447
SD in Original Scale	19.77	SD in Log Scale	2.193
95% t UCL (Assumes normality)	22.79	95% H-Stat UCL	2144

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	23.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ATTACHMENT 3

ProUCL Output - Groundwater (VOC Plume Core), Trench/Culvert Scenario

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Trichloroethene

General Statistics

Total Number of Observations	9	Number of Distinct Observations	6
Number of Detects	3	Number of Non-Detects	6
Number of Distinct Detects	3	Number of Distinct Non-Detects	3
Minimum Detect	2.8	Minimum Non-Detect	0.4
Maximum Detect	82	Maximum Non-Detect	40
Variance Detects	1660	Percent Non-Detects	66.67%
Mean Detects	47.93	SD Detects	40.74
Median Detects	59	CV Detects	0.85
Skewness Detects	-1.132	Kurtosis Detects	N/A
Mean of Logged Detects	3.171	SD of Logged Detects	1.862

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.

For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).

Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.274	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	16.35	KM Standard Error of Mean	12.03
KM SD	29.46	95% KM (BCA) UCL	N/A
95% KM (t) UCL	38.72	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	36.14	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	52.44	95% KM Chebyshev UCL	68.78
97.5% KM Chebyshev UCL	91.47	99% KM Chebyshev UCL	136

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.844	k star (bias corrected MLE)	N/A
Theta hat (MLE)	56.81	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.063	nu star (bias corrected)	N/A
Mean (detects)	47.93		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	15.98
Maximum	82	Median	0.01
SD	31.45	CV	1.968
k hat (MLE)	0.159	k star (bias corrected MLE)	0.18
Theta hat (MLE)	100.4	Theta star (bias corrected MLE)	88.69
nu hat (MLE)	2.866	nu star (bias corrected)	3.244
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.24, α)	0.448	Adjusted Chi Square Value (3.24, β)	0.286
95% Gamma Approximate UCL (use when n>=50)	115.7	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	16.35	SD (KM)	29.46
Variance (KM)	867.8	SE of Mean (KM)	12.03
k hat (KM)	0.308	k star (KM)	0.279
nu hat (KM)	5.545	nu star (KM)	5.03
theta hat (KM)	53.08	theta star (KM)	58.51
80% gamma percentile (KM)	24.61	90% gamma percentile (KM)	48.61
95% gamma percentile (KM)	76.5	99% gamma percentile (KM)	149.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.03, α)	1.166	Adjusted Chi Square Value (5.03, β)	0.824
95% Gamma Approximate KM-UCL (use when n>=50)	70.53	95% Gamma Adjusted KM-UCL (use when n<50)	99.81

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.822	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.353	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	16.1	Mean in Log Scale	-0.495
SD in Original Scale	31.38	SD in Log Scale	3.143
95% t UCL (assumes normality of ROS data)	35.55	95% Percentile Bootstrap UCL	34.21
95% BCA Bootstrap UCL	38.24	95% Bootstrap t UCL	569.2
95% H-UCL (Log ROS)	1391610		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.533	KM Geo Mean	1.704
KM SD (logged)	2.1	95% Critical H Value (KM-Log)	5.969
KM Standard Error of Mean (logged)	0.875	95% H-UCL (KM -Log)	1297
KM SD (logged)	2.1	95% Critical H Value (KM-Log)	5.969
KM Standard Error of Mean (logged)	0.875		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	18.51	Mean in Log Scale	0.752
SD in Original Scale	30.69	SD in Log Scale	2.546
95% t UCL (Assumes normality)	37.53	95% H-Stat UCL	33467

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 38.72

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Vinyl chloride

General Statistics

Total Number of Observations	9	Number of Distinct Observations	5
Number of Detects	4	Number of Non-Detects	5
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.24	Minimum Non-Detect	0.2
Maximum Detect	510	Maximum Non-Detect	2
Variance Detects	61013	Percent Non-Detects	55.56%
Mean Detects	141.3	SD Detects	247
Median Detects	27.5	CV Detects	1.748
Skewness Detects	1.943	Kurtosis Detects	3.792
Mean of Logged Detects	2.368	SD of Logged Detects	3.402

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.704	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.39	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	62.92	KM Standard Error of Mean	61.17
KM SD	158.9	95% KM (BCA) UCL	N/A
95% KM (t) UCL	176.7	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	163.5	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	246.4	95% KM Chebyshev UCL	329.5
97.5% KM Chebyshev UCL	444.9	99% KM Chebyshev UCL	671.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.273	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.712	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.255	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.42	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.271	k star (bias corrected MLE)	0.235
Theta hat (MLE)	520.8	Theta star (bias corrected MLE)	602.6
nu hat (MLE)	2.171	nu star (bias corrected)	1.876
Mean (detects)	141.3		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	62.81
Maximum	510	Median	0.01
SD	168.6	CV	2.684
k hat (MLE)	0.138	k star (bias corrected MLE)	0.166
Theta hat (MLE)	455.8	Theta star (bias corrected MLE)	378.5
nu hat (MLE)	2.48	nu star (bias corrected)	2.987
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (2.99, α)	0.369	Adjusted Chi Square Value (2.99, β)	0.233
95% Gamma Approximate UCL (use when n>=50)	509.1	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	62.92	SD (KM)	158.9
Variance (KM)	25254	SE of Mean (KM)	61.17
k hat (KM)	0.157	k star (KM)	0.179
nu hat (KM)	2.821	nu star (KM)	3.214
theta hat (KM)	401.4	theta star (KM)	352.3
80% gamma percentile (KM)	77.67	90% gamma percentile (KM)	189.7
95% gamma percentile (KM)	333.5	99% gamma percentile (KM)	737.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.21, α)	0.439	Adjusted Chi Square Value (3.21, β)	0.279
95% Gamma Approximate KM-UCL (use when n>=50)	461.1	95% Gamma Adjusted KM-UCL (use when n<50)	724.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.974	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.189	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	62.81	Mean in Log Scale	-3.296
SD in Original Scale	168.6	SD in Log Scale	6.114
95% t UCL (assumes normality of ROS data)	167.3	95% Percentile Bootstrap UCL	170.3
95% BCA Bootstrap UCL	226.7	95% Bootstrap t UCL	16163
95% H-UCL (Log ROS)	2.549E+22		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.162	KM Geo Mean	1.176
KM SD (logged)	2.784	95% Critical H Value (KM-Log)	7.773
KM Standard Error of Mean (logged)	1.072	95% H-UCL (KM -Log)	119192
KM SD (logged)	2.784	95% Critical H Value (KM-Log)	7.773
KM Standard Error of Mean (logged)	1.072		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	62.96	Mean in Log Scale	0.0289
SD in Original Scale	168.5	SD in Log Scale	3.129
95% t UCL (Assumes normality)	167.4	95% H-Stat UCL	2077683

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	N/A	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	724.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Xylene, m,p-

General Statistics

Total Number of Observations	9	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	4
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.19	Minimum Non-Detect	0.8
Maximum Detect	570	Maximum Non-Detect	0.8
Variance Detects	49145	Percent Non-Detects	44.44%
Mean Detects	214.8	SD Detects	221.7
Median Detects	150	CV Detects	1.032
Skewness Detects	1.245	Kurtosis Detects	1.499
Mean of Logged Detects	3.945	SD of Logged Detects	3.213

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.215	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	119.4	KM Standard Error of Mean	67.92
KM SD	182.3	95% KM (BCA) UCL	237
95% KM (t) UCL	245.7	95% KM (Percentile Bootstrap) UCL	233.4
95% KM (z) UCL	231.2	95% KM Bootstrap t UCL	321.2
90% KM Chebyshev UCL	323.2	95% KM Chebyshev UCL	415.5
97.5% KM Chebyshev UCL	543.6	99% KM Chebyshev UCL	795.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.43	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.718	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.289	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.374	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.453	k star (bias corrected MLE)	0.314
Theta hat (MLE)	474.5	Theta star (bias corrected MLE)	683.3
nu hat (MLE)	4.528	nu star (bias corrected)	3.144
Mean (detects)	214.8		

ATTACHMENT 3

ProUCL Output - Groundwater (VOC Plume Core), Trench/Culvert Scenario

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	119.4
Maximum	570	Median	0.19
SD	193.4	CV	1.62
k hat (MLE)	0.164	k star (bias corrected MLE)	0.183
Theta hat (MLE)	729.4	Theta star (bias corrected MLE)	651.7
nu hat (MLE)	2.945	nu star (bias corrected)	3.297
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.30, α)	0.466	Adjusted Chi Square Value (3.30, β)	0.298
95% Gamma Approximate UCL (use when n>=50)	845.3	95% Gamma Adjusted UCL (use when n<50)	1322

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	119.4	SD (KM)	182.3
Variance (KM)	33218	SE of Mean (KM)	67.92
k hat (KM)	0.429	k star (KM)	0.36
nu hat (KM)	7.73	nu star (KM)	6.487
theta hat (KM)	278.1	theta star (KM)	331.4
80% gamma percentile (KM)	190	90% gamma percentile (KM)	343.3
95% gamma percentile (KM)	514.3	99% gamma percentile (KM)	949.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.49, α)	1.893	Adjusted Chi Square Value (6.49, β)	1.417
95% Gamma Approximate KM-UCL (use when n>=50)	409.2	95% Gamma Adjusted KM-UCL (use when n<50)	546.8

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.76	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	119.8	Mean in Log Scale	1.742
SD in Original Scale	193.1	SD in Log Scale	3.664
95% t UCL (assumes normality of ROS data)	239.5	95% Percentile Bootstrap UCL	229.4
95% BCA Bootstrap UCL	259.5	95% Bootstrap t UCL	409.4
95% H-UCL (Log ROS)	2.344E+9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.454	KM Geo Mean	4.278
KM SD (logged)	3.514	95% Critical H Value (KM-Log)	9.725
KM Standard Error of Mean (logged)	1.31	95% H-UCL (KM -Log)	3.626E+8
KM SD (logged)	3.514	95% Critical H Value (KM-Log)	9.725
KM Standard Error of Mean (logged)	1.31		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	119.5	Mean in Log Scale	1.784
SD in Original Scale	193.3	SD in Log Scale	3.424
95% t UCL (Assumes normality)	239.3	95% H-Stat UCL	2.034E+8

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 245.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Xylene, o-

General Statistics

Total Number of Observations	9	Number of Distinct Observations	5
Number of Detects	4	Number of Non-Detects	5
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	14	Minimum Non-Detect	0.4
Maximum Detect	210	Maximum Non-Detect	0.4
Variance Detects	7044	Percent Non-Detects	55.56%
Mean Detects	92.25	SD Detects	83.93
Median Detects	72.5	CV Detects	0.91
Skewness Detects	1.259	Kurtosis Detects	2.015
Mean of Logged Detects	4.13	SD of Logged Detects	1.127

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.28	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

ATTACHMENT 3

ProUCL Output - Groundwater (VOC Plume Core), Trench/Culvert Scenario

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	41.22	KM Standard Error of Mean	25.62
KM SD	66.57	95% KM (BCA) UCL	N/A
95% KM (t) UCL	88.87	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	83.37	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	118.1	95% KM Chebyshev UCL	152.9
97.5% KM Chebyshev UCL	201.2	99% KM Chebyshev UCL	296.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.215	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.663	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.17	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.4	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.409	k star (bias corrected MLE)	0.519
Theta hat (MLE)	65.46	Theta star (bias corrected MLE)	177.8
nu hat (MLE)	11.27	nu star (bias corrected)	4.152
Mean (detects)	92.25		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	41.01
Maximum	210	Median	0.01
SD	70.75	CV	1.725
k hat (MLE)	0.17	k star (bias corrected MLE)	0.187
Theta hat (MLE)	241.1	Theta star (bias corrected MLE)	218.8
nu hat (MLE)	3.061	nu star (bias corrected)	3.374
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (3.37, α)	0.491	Adjusted Chi Square Value (3.37, β)	0.315
95% Gamma Approximate UCL (use when n>=50)	281.6	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	41.22	SD (KM)	66.57
Variance (KM)	4431	SE of Mean (KM)	25.62
k hat (KM)	0.383	k star (KM)	0.33
nu hat (KM)	6.903	nu star (KM)	5.935
theta hat (KM)	107.5	theta star (KM)	125
80% gamma percentile (KM)	64.56	90% gamma percentile (KM)	120.1
95% gamma percentile (KM)	182.9	99% gamma percentile (KM)	344.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.94, α)	1.607	Adjusted Chi Square Value (5.94, β)	1.18
95% Gamma Approximate KM-UCL (use when n>=50)	152.3	95% Gamma Adjusted KM-UCL (use when n<50)	207.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.971	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.232	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	42.35	Mean in Log Scale	2.05
SD in Original Scale	69.9	SD in Log Scale	2.265
95% t UCL (assumes normality of ROS data)	85.67	95% Percentile Bootstrap UCL	82.71
95% BCA Bootstrap UCL	100.9	95% Bootstrap t UCL	161.7
95% H-UCL (Log ROS)	17054		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.326	KM Geo Mean	3.767
KM SD (logged)	2.59	95% Critical H Value (KM-Log)	7.26
KM Standard Error of Mean (logged)	0.997	95% H-UCL (KM -Log)	83296
KM SD (logged)	2.59	95% Critical H Value (KM-Log)	7.26
KM Standard Error of Mean (logged)	0.997		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	41.11	Mean in Log Scale	0.941
SD in Original Scale	70.68	SD in Log Scale	3.102
95% t UCL (Assumes normality)	84.92	95% H-Stat UCL	4044298

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	88.87

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

1,1,1-Trichloroethane

General Statistics

Total Number of Observations	14	Number of Distinct Observations	11
Number of Detects	9	Number of Non-Detects	5
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	0.24	Minimum Non-Detect	0.4
Maximum Detect	2000	Maximum Non-Detect	16
Variance Detects	435620	Percent Non-Detects	35.71%
Mean Detects	241.4	SD Detects	660
Median Detects	12	CV Detects	2.734
Skewness Detects	2.99	Kurtosis Detects	8.957
Mean of Logged Detects	2.592	SD of Logged Detects	2.671

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.421	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.481	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	155.5	KM Standard Error of Mean	145.2
KM SD	512.1	95% KM (BCA) UCL	446.6
95% KM (t) UCL	412.6	95% KM (Percentile Bootstrap) UCL	437.7
95% KM (z) UCL	394.3	95% KM Bootstrap t UCL	8063
90% KM Chebyshev UCL	591	95% KM Chebyshev UCL	788.3
97.5% KM Chebyshev UCL	1062	99% KM Chebyshev UCL	1600

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.949	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.829	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.306	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.305	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.246	k star (bias corrected MLE)	0.238
Theta hat (MLE)	981.3	Theta star (bias corrected MLE)	1014
nu hat (MLE)	4.429	nu star (bias corrected)	4.286
Mean (detects)	241.4		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	155.2
Maximum	2000	Median	4
SD	531.5	CV	3.424
k hat (MLE)	0.153	k star (bias corrected MLE)	0.168
Theta hat (MLE)	1017	Theta star (bias corrected MLE)	926.4
nu hat (MLE)	4.274	nu star (bias corrected)	4.691
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (4.69, α)	1.012	Adjusted Chi Square Value (4.69, β)	0.808
95% Gamma Approximate UCL (use when n>=50)	719.3	95% Gamma Adjusted UCL (use when n<50)	900.7

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	155.5	SD (KM)	512.1
Variance (KM)	262214	SE of Mean (KM)	145.2
k hat (KM)	0.0922	k star (KM)	0.12
nu hat (KM)	2.583	nu star (KM)	3.363
theta hat (KM)	1686	theta star (KM)	1295
80% gamma percentile (KM)	136.5	90% gamma percentile (KM)	440.7
95% gamma percentile (KM)	887.4	99% gamma percentile (KM)	2250

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.36, α)	0.488	Adjusted Chi Square Value (3.36, β)	0.37
95% Gamma Approximate KM-UCL (use when n>=50)	1073	95% Gamma Adjusted KM-UCL (use when n<50)	1413

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	155.3	Mean in Log Scale	1.05
SD in Original Scale	531.5	SD in Log Scale	3.107
95% t UCL (assumes normality of ROS data)	406.9	95% Percentile Bootstrap UCL	438.1
95% BCA Bootstrap UCL	581.7	95% Bootstrap t UCL	8663
95% H-UCL (Log ROS)	144192		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.25	KM Geo Mean	3.492
KM SD (logged)	2.761	95% Critical H Value (KM-Log)	6.241
KM Standard Error of Mean (logged)	0.794	95% H-UCL (KM -Log)	18797
KM SD (logged)	2.761	95% Critical H Value (KM-Log)	6.241
KM Standard Error of Mean (logged)	0.794		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	155.8	Mean in Log Scale	1.355
SD in Original Scale	531.3	SD in Log Scale	2.863
95% t UCL (Assumes normality)	407.3	95% H-Stat UCL	39267

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

99% KM (Chebyshev) UCL 1600

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1,2-Trichloroethane

General Statistics

Total Number of Observations	14	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	10
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	0.4	Minimum Non-Detect	0.8
Maximum Detect	2.5	Maximum Non-Detect	80
Variance Detects	0.884	Percent Non-Detects	71.43%
Mean Detects	1.21	SD Detects	0.94
Median Detects	0.97	CV Detects	0.777
Skewness Detects	1.147	Kurtosis Detects	0.586
Mean of Logged Detects	-0.046	SD of Logged Detects	0.804

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.228	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.771	KM Standard Error of Mean	0.221
KM SD	0.6	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.162	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.134	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.433	95% KM Chebyshev UCL	1.733
97.5% KM Chebyshev UCL	2.149	99% KM Chebyshev UCL	2.967

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.246	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.66	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.237	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.398	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.266	k star (bias corrected MLE)	0.733
Theta hat (MLE)	0.534	Theta star (bias corrected MLE)	1.65
nu hat (MLE)	18.13	nu star (bias corrected)	5.865
Mean (detects)	1.21		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.729
Maximum	2.5	Median	0.622
SD	0.612	CV	0.84
k hat (MLE)	1.267	k star (bias corrected MLE)	1.043
Theta hat (MLE)	0.575	Theta star (bias corrected MLE)	0.699
nu hat (MLE)	35.48	nu star (bias corrected)	29.21
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (29.21, α)	17.87	Adjusted Chi Square Value (29.21, β)	16.7
95% Gamma Approximate UCL (use when n>=50)	1.191	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.771	SD (KM)	0.6
Variance (KM)	0.361	SE of Mean (KM)	0.221
k hat (KM)	1.648	k star (KM)	1.343
nu hat (KM)	46.15	nu star (KM)	37.6
theta hat (KM)	0.468	theta star (KM)	0.574
80% gamma percentile (KM)	1.207	90% gamma percentile (KM)	1.651
95% gamma percentile (KM)	2.085	99% gamma percentile (KM)	3.072

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (37.60, α)	24.56	Adjusted Chi Square Value (37.60, β)	23.17
95% Gamma Approximate KM-UCL (use when n>=50)	1.18	95% Gamma Adjusted KM-UCL (use when n<50)	1.251

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.191	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.749	Mean in Log Scale	-0.477
SD in Original Scale	0.573	SD in Log Scale	0.6
95% t UCL (assumes normality of ROS data)	1.02	95% Percentile Bootstrap UCL	1.03
95% BCA Bootstrap UCL	1.139	95% Bootstrap t UCL	1.367
95% H-UCL (Log ROS)	1.072		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.45	KM Geo Mean	0.637
KM SD (logged)	0.552	95% Critical H Value (KM-Log)	2.089
KM Standard Error of Mean (logged)	0.237	95% H-UCL (KM -Log)	1.022
KM SD (logged)	0.552	95% Critical H Value (KM-Log)	2.089
KM Standard Error of Mean (logged)	0.237		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4.831	Mean in Log Scale	0.0893
SD in Original Scale	10.94	SD in Log Scale	1.542
95% t UCL (Assumes normality)	10.01	95% H-Stat UCL	18.04

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 1.162

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1-Dichloroethane

General Statistics

Total Number of Observations	14	Number of Distinct Observations	12
Number of Detects	11	Number of Non-Detects	3
Number of Distinct Detects	11	Number of Distinct Non-Detects	1
Minimum Detect	0.71	Minimum Non-Detect	0.8
Maximum Detect	4900	Maximum Non-Detect	0.8
Variance Detects	2134647	Percent Non-Detects	21.43%
Mean Detects	502.4	SD Detects	1461
Median Detects	18	CV Detects	2.908
Skewness Detects	3.296	Kurtosis Detects	10.9
Mean of Logged Detects	3.085	SD of Logged Detects	2.736

ATTACHMENT 3

ProUCL Output - Groundwater (VOC Plume Core), Potable Use Scenario

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.39	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.483	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	394.9	KM Standard Error of Mean	350.9
KM SD	1252	95% KM (BCA) UCL	1092
95% KM (t) UCL	1016	95% KM (Percentile Bootstrap) UCL	1081
95% KM (z) UCL	972.1	95% KM Bootstrap t UCL	8324
90% KM Chebyshev UCL	1448	95% KM Chebyshev UCL	1924
97.5% KM Chebyshev UCL	2586	99% KM Chebyshev UCL	3886

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.022	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.849	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.267	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.28	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.23	k star (bias corrected MLE)	0.228
Theta hat (MLE)	2187	Theta star (bias corrected MLE)	2207
nu hat (MLE)	5.054	nu star (bias corrected)	5.009
Mean (detects)	502.4		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	394.8
Maximum	4900	Median	5.2
SD	1299	CV	3.291
k hat (MLE)	0.167	k star (bias corrected MLE)	0.179
Theta hat (MLE)	2369	Theta star (bias corrected MLE)	2211
nu hat (MLE)	4.666	nu star (bias corrected)	4.999
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.00, α)	1.152	Adjusted Chi Square Value (5.00, β)	0.929
95% Gamma Approximate UCL (use when n>=50)	1713	95% Gamma Adjusted UCL (use when n<50)	2125

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	394.9	SD (KM)	1252
Variance (KM)	1567132	SE of Mean (KM)	350.9
k hat (KM)	0.0995	k star (KM)	0.126
nu hat (KM)	2.787	nu star (KM)	3.523
theta hat (KM)	3968	theta star (KM)	3139
80% gamma percentile (KM)	364.8	90% gamma percentile (KM)	1133
95% gamma percentile (KM)	2239	99% gamma percentile (KM)	5578

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.52, α)	0.543	Adjusted Chi Square Value (3.52, β)	0.415
95% Gamma Approximate KM-UCL (use when n>=50)	2563	95% Gamma Adjusted KM-UCL (use when n<50)	3355

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.126	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	394.9	Mean in Log Scale	2.21
SD in Original Scale	1299	SD in Log Scale	3.002
95% t UCL (assumes normality of ROS data)	1010	95% Percentile Bootstrap UCL	1077
95% BCA Bootstrap UCL	1459	95% Bootstrap t UCL	8437
95% H-UCL (Log ROS)	226628		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.352	KM Geo Mean	10.51
KM SD (logged)	2.705	95% Critical H Value (KM-Log)	6.124
KM Standard Error of Mean (logged)	0.758	95% H-UCL (KM -Log)	40402
KM SD (logged)	2.705	95% Critical H Value (KM-Log)	6.124
KM Standard Error of Mean (logged)	0.758		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	394.9	Mean in Log Scale	2.228
SD in Original Scale	1299	SD in Log Scale	2.943
95% t UCL (Assumes normality)	1010	95% H-Stat UCL	157343

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	8324	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	3355

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,1-Dichloroethene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	10
Number of Detects	8	Number of Non-Detects	6
Number of Distinct Detects	8	Number of Distinct Non-Detects	2
Minimum Detect	1.4	Minimum Non-Detect	0.8
Maximum Detect	270	Maximum Non-Detect	8
Variance Detects	8601	Percent Non-Detects	42.86%
Mean Detects	101.3	SD Detects	92.74
Median Detects	69	CV Detects	0.916
Skewness Detects	1.083	Kurtosis Detects	0.111
Mean of Logged Detects	3.976	SD of Logged Detects	1.632

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.879	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.213	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	58.24	KM Standard Error of Mean	23.51
KM SD	82.3	95% KM (BCA) UCL	98.01
95% KM (t) UCL	99.88	95% KM (Percentile Bootstrap) UCL	97.96
95% KM (z) UCL	96.91	95% KM Bootstrap t UCL	141.6
90% KM Chebyshev UCL	128.8	95% KM Chebyshev UCL	160.7
97.5% KM Chebyshev UCL	205.1	99% KM Chebyshev UCL	292.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.307	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.739	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.214	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.302	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.91	k star (bias corrected MLE)	0.652
Theta hat (MLE)	111.4	Theta star (bias corrected MLE)	155.4
nu hat (MLE)	14.55	nu star (bias corrected)	10.43
Mean (detects)	101.3		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	57.89
Maximum	270	Median	20.2
SD	85.66	CV	1.48
k hat (MLE)	0.196	k star (bias corrected MLE)	0.202
Theta hat (MLE)	294.9	Theta star (bias corrected MLE)	286.8
nu hat (MLE)	5.496	nu star (bias corrected)	5.652
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.65, α)	1.465	Adjusted Chi Square Value (5.65, β)	1.202
95% Gamma Approximate UCL (use when n>=50)	223.4	95% Gamma Adjusted UCL (use when n<50)	272.1

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	58.24	SD (KM)	82.3
Variance (KM)	6773	SE of Mean (KM)	23.51
k hat (KM)	0.501	k star (KM)	0.441
nu hat (KM)	14.02	nu star (KM)	12.35
theta hat (KM)	116.3	theta star (KM)	132
80% gamma percentile (KM)	94.9	90% gamma percentile (KM)	161.6
95% gamma percentile (KM)	233.9	99% gamma percentile (KM)	413.9

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.35, α)	5.458	Adjusted Chi Square Value (12.35, β)	4.863
95% Gamma Approximate KM-UCL (use when n>=50)	131.8	95% Gamma Adjusted KM-UCL (use when n<50)	147.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.82	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.299	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Detected Data Not Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	58.58	Mean in Log Scale	2.335
SD in Original Scale	85.16	SD in Log Scale	2.386
95% t UCL (assumes normality of ROS data)	98.89	95% Percentile Bootstrap UCL	97.38
95% BCA Bootstrap UCL	103.3	95% Bootstrap t UCL	130.2
95% H-UCL (Log ROS)	6620		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.183	KM Geo Mean	8.874
KM SD (logged)	2.371	95% Critical H Value (KM-Log)	5.431
KM Standard Error of Mean (logged)	0.678	95% H-UCL (KM -Log)	5246

KM SD (logged)	2.371	95% Critical H Value (KM-Log)	5.431
KM Standard Error of Mean (logged)	0.678		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	58.31	Mean in Log Scale	2.044
SD in Original Scale	85.35	SD in Log Scale	2.671
95% t UCL (Assumes normality)	98.71	95% H-Stat UCL	24237

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	99.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,2,4-Trimethylbenzene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	9
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.33	Minimum Non-Detect	0.4
Maximum Detect	110	Maximum Non-Detect	0.4
Variance Detects	1764	Percent Non-Detects	64.29%
Mean Detects	46.47	SD Detects	42
Median Detects	34	CV Detects	0.904
Skewness Detects	0.849	Kurtosis Detects	0.494
Mean of Logged Detects	2.896	SD of Logged Detects	2.31

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.217	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	16.81	KM Standard Error of Mean	9.414
KM SD	31.51	95% KM (BCA) UCL	32.53
95% KM (t) UCL	33.48	95% KM (Percentile Bootstrap) UCL	31.83
95% KM (z) UCL	32.29	95% KM Bootstrap t UCL	36.31
90% KM Chebyshev UCL	45.05	95% KM Chebyshev UCL	57.84

97.5% KM Chebyshev UCL	75.6	99% KM Chebyshev UCL	110.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.407	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.703	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.292	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.369	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.648	k star (bias corrected MLE)	0.393
Theta hat (MLE)	71.69	Theta star (bias corrected MLE)	118.4
nu hat (MLE)	6.481	nu star (bias corrected)	3.926
Mean (detects)	46.47		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	17.84
Maximum	110	Median	0.17
SD	32.31	CV	1.811
k hat (MLE)	0.192	k star (bias corrected MLE)	0.199
Theta hat (MLE)	92.9	Theta star (bias corrected MLE)	89.87
nu hat (MLE)	5.377	nu star (bias corrected)	5.558
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.56, α)	1.418	Adjusted Chi Square Value (5.56, β)	1.162
95% Gamma Approximate UCL (use when n>=50)	69.91	95% Gamma Adjusted UCL (use when n<50)	85.36

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	16.81	SD (KM)	31.51
Variance (KM)	992.6	SE of Mean (KM)	9.414
k hat (KM)	0.285	k star (KM)	0.271
nu hat (KM)	7.968	nu star (KM)	7.594
theta hat (KM)	59.06	theta star (KM)	61.97
80% gamma percentile (KM)	25.07	90% gamma percentile (KM)	50.11
95% gamma percentile (KM)	79.37	99% gamma percentile (KM)	156.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.59, α)	2.502	Adjusted Chi Square Value (7.59, β)	2.132
95% Gamma Approximate KM-UCL (use when n>=50)	51.01	95% Gamma Adjusted KM-UCL (use when n<50)	59.87

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.781	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.356	**Lilliefors GOF Test**	

5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	17.31	Mean in Log Scale	0.404
SD in Original Scale	32.44	SD in Log Scale	2.735
95% t UCL (assumes normality of ROS data)	32.67	95% Percentile Bootstrap UCL	32.23
95% BCA Bootstrap UCL	36.57	95% Bootstrap t UCL	54.82
95% H-UCL (Log ROS)	6866		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.322	KM Geo Mean	1.379
KM SD (logged)	2.282	95% Critical H Value (KM-Log)	5.248
KM Standard Error of Mean (logged)	0.682	95% H-UCL (KM -Log)	516.1
KM SD (logged)	2.282	95% Critical H Value (KM-Log)	5.248
KM Standard Error of Mean (logged)	0.682		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	16.72	Mean in Log Scale	-3.395E-4
SD in Original Scale	32.74	SD in Log Scale	2.581
95% t UCL (Assumes normality)	32.22	95% H-Stat UCL	1862

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	33.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,2-Dichloroethane

General Statistics

Total Number of Observations	14	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	7
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	0.82	Minimum Non-Detect	0.4
Maximum Detect	81	Maximum Non-Detect	0.4
Variance Detects	847.8	Percent Non-Detects	50%
Mean Detects	22.57	SD Detects	29.12
Median Detects	9.9	CV Detects	1.29
Skewness Detects	1.61	Kurtosis Detects	2.586
Mean of Logged Detects	2.055	SD of Logged Detects	1.795

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.24	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	11.49	KM Standard Error of Mean	6.366
KM SD	22.05	95% KM (BCA) UCL	22.91
95% KM (t) UCL	22.76	95% KM (Percentile Bootstrap) UCL	22.13
95% KM (z) UCL	21.96	95% KM Bootstrap t UCL	33.79
90% KM Chebyshev UCL	30.58	95% KM Chebyshev UCL	39.23
97.5% KM Chebyshev UCL	51.24	99% KM Chebyshev UCL	74.83

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.384	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.251	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.326	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.584	k star (bias corrected MLE)	0.429
Theta hat (MLE)	38.63	Theta star (bias corrected MLE)	52.6
nu hat (MLE)	8.181	nu star (bias corrected)	6.008
Mean (detects)	22.57		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	11.29
Maximum	81	Median	0.415
SD	22.99	CV	2.036
k hat (MLE)	0.199	k star (bias corrected MLE)	0.204
Theta hat (MLE)	56.72	Theta star (bias corrected MLE)	55.34
nu hat (MLE)	5.575	nu star (bias corrected)	5.713
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.71, α)	1.495	Adjusted Chi Square Value (5.71, β)	1.229
95% Gamma Approximate UCL (use when n>=50)	43.15	95% Gamma Adjusted UCL (use when n<50)	52.48

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	11.49	SD (KM)	22.05
Variance (KM)	486.3	SE of Mean (KM)	6.366

k hat (KM)	0.271	k star (KM)	0.261
nu hat (KM)	7.598	nu star (KM)	7.303
theta hat (KM)	42.33	theta star (KM)	44.04
80% gamma percentile (KM)	16.93	90% gamma percentile (KM)	34.37
95% gamma percentile (KM)	54.9	99% gamma percentile (KM)	109.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.30, α)	2.338	Adjusted Chi Square Value (7.30, β)	1.983
95% Gamma Approximate KM-UCL (use when n>=50)	35.88	95% Gamma Adjusted KM-UCL (use when n<50)	42.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.905	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.231	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	11.34	Mean in Log Scale	-0.592
SD in Original Scale	22.96	SD in Log Scale	3.225
95% t UCL (assumes normality of ROS data)	22.2	95% Percentile Bootstrap UCL	21.32
95% BCA Bootstrap UCL	26.89	95% Bootstrap t UCL	34.38
95% H-UCL (Log ROS)	63659		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.569	KM Geo Mean	1.767
KM SD (logged)	1.894	95% Critical H Value (KM-Log)	4.462
KM Standard Error of Mean (logged)	0.547	95% H-UCL (KM -Log)	110.9
KM SD (logged)	1.894	95% Critical H Value (KM-Log)	4.462
KM Standard Error of Mean (logged)	0.547		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	11.39	Mean in Log Scale	0.223
SD in Original Scale	22.94	SD in Log Scale	2.259
95% t UCL (Assumes normality)	22.24	95% H-Stat UCL	416.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 22.76

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1,3,5-Trimethylbenzene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	5
Number of Detects	4	Number of Non-Detects	10
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	4.7	Minimum Non-Detect	0.4
Maximum Detect	34	Maximum Non-Detect	0.4
Variance Detects	162.9	Percent Non-Detects	71.43%
Mean Detects	16.15	SD Detects	12.76
Median Detects	12.95	CV Detects	0.79
Skewness Detects	1.264	Kurtosis Detects	1.596
Mean of Logged Detects	2.535	SD of Logged Detects	0.831

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.916	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.255	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.9	KM Standard Error of Mean	2.854
KM SD	9.249	95% KM (BCA) UCL	N/A
95% KM (t) UCL	9.955	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	9.595	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	13.46	95% KM Chebyshev UCL	17.34
97.5% KM Chebyshev UCL	22.72	99% KM Chebyshev UCL	33.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.209	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.66	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.179	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.398	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.175	k star (bias corrected MLE)	0.71
Theta hat (MLE)	7.425	Theta star (bias corrected MLE)	22.73
nu hat (MLE)	17.4	nu star (bias corrected)	5.683
Mean (detects)	16.15		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4.621
Maximum	34	Median	0.01
SD	9.739	CV	2.107
k hat (MLE)	0.182	k star (bias corrected MLE)	0.191
Theta hat (MLE)	25.36	Theta star (bias corrected MLE)	24.22
nu hat (MLE)	5.104	nu star (bias corrected)	5.343
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.34, α)	1.314	Adjusted Chi Square Value (5.34, β)	1.07
95% Gamma Approximate UCL (use when n>=50)	18.79	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.9	SD (KM)	9.249
Variance (KM)	85.54	SE of Mean (KM)	2.854
k hat (KM)	0.281	k star (KM)	0.268
nu hat (KM)	7.859	nu star (KM)	7.508
theta hat (KM)	17.46	theta star (KM)	18.27
80% gamma percentile (KM)	7.284	90% gamma percentile (KM)	14.62
95% gamma percentile (KM)	23.22	99% gamma percentile (KM)	45.88

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.51, α)	2.454	Adjusted Chi Square Value (7.51, β)	2.088
95% Gamma Approximate KM-UCL (use when n>=50)	14.99	95% Gamma Adjusted KM-UCL (use when n<50)	17.62

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.137	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	5.123	Mean in Log Scale	7.2017E-5
SD in Original Scale	9.507	SD in Log Scale	2.064
95% t UCL (assumes normality of ROS data)	9.623	95% Percentile Bootstrap UCL	9.557
95% BCA Bootstrap UCL	11.78	95% Bootstrap t UCL	18.15
95% H-UCL (Log ROS)	131.5		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0697	KM Geo Mean	1.072
KM SD (logged)	1.606	95% Critical H Value (KM-Log)	3.894
KM Standard Error of Mean (logged)	0.496	95% H-UCL (KM -Log)	22.05
KM SD (logged)	1.606	95% Critical H Value (KM-Log)	3.894
KM Standard Error of Mean (logged)	0.496		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

Mean in Original Scale	4.757	Mean in Log Scale	-0.425
SD in Original Scale	9.67	SD in Log Scale	1.983
95% t UCL (Assumes normality)	9.334	95% H-Stat UCL	60.04

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 9.955

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Benzene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	7
Number of Distinct Detects	7	Number of Distinct Non-Detects	1
Minimum Detect	0.87	Minimum Non-Detect	0.4
Maximum Detect	88	Maximum Non-Detect	0.4
Variance Detects	1399	Percent Non-Detects	50%
Mean Detects	38.25	SD Detects	37.4
Median Detects	45	CV Detects	0.978
Skewness Detects	0.297	Kurtosis Detects	-1.843
Mean of Logged Detects	2.564	SD of Logged Detects	2.047

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.242	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	19.33	KM Standard Error of Mean	8.933
KM SD	30.95	95% KM (BCA) UCL	35.28
95% KM (t) UCL	35.15	95% KM (Percentile Bootstrap) UCL	33.78
95% KM (z) UCL	34.02	95% KM Bootstrap t UCL	42.13
90% KM Chebyshev UCL	46.13	95% KM Chebyshev UCL	58.26
97.5% KM Chebyshev UCL	75.11	99% KM Chebyshev UCL	108.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.59	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Level

K-S Test Statistic	0.286	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.326	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.576	k star (bias corrected MLE)	0.424
Theta hat (MLE)	66.45	Theta star (bias corrected MLE)	90.17
nu hat (MLE)	8.059	nu star (bias corrected)	5.939
Mean (detects)	38.25		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	19.13
Maximum	88	Median	0.44
SD	32.24	CV	1.685
k hat (MLE)	0.187	k star (bias corrected MLE)	0.195
Theta hat (MLE)	102.2	Theta star (bias corrected MLE)	98.25
nu hat (MLE)	5.242	nu star (bias corrected)	5.452
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.45, α)	1.366	Adjusted Chi Square Value (5.45, β)	1.116
95% Gamma Approximate UCL (use when n>=50)	76.33	95% Gamma Adjusted UCL (use when n<50)	93.45

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	19.33	SD (KM)	30.95
Variance (KM)	957.7	SE of Mean (KM)	8.933
k hat (KM)	0.39	k star (KM)	0.354
nu hat (KM)	10.92	nu star (KM)	9.912
theta hat (KM)	49.56	theta star (KM)	54.59
80% gamma percentile (KM)	30.66	90% gamma percentile (KM)	55.71
95% gamma percentile (KM)	83.71	99% gamma percentile (KM)	155.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.91, α)	3.887	Adjusted Chi Square Value (9.91, β)	3.401
95% Gamma Approximate KM-UCL (use when n>=50)	49.28	95% Gamma Adjusted KM-UCL (use when n<50)	56.32

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.818	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.3	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	19.19	Mean in Log Scale	-0.238

SD in Original Scale	32.2	SD in Log Scale	3.453
95% t UCL (assumes normality of ROS data)	34.43	95% Percentile Bootstrap UCL	34.27
95% BCA Bootstrap UCL	37.09	95% Bootstrap t UCL	42.97
95% H-UCL (Log ROS)	486960		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.824	KM Geo Mean	2.279
KM SD (logged)	2.196	95% Critical H Value (KM-Log)	5.073
KM Standard Error of Mean (logged)	0.634	95% H-UCL (KM -Log)	558.8
KM SD (logged)	2.196	95% Critical H Value (KM-Log)	5.073
KM Standard Error of Mean (logged)	0.634		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	19.23	Mean in Log Scale	0.477
SD in Original Scale	32.18	SD in Log Scale	2.574
95% t UCL (Assumes normality)	34.45	95% H-Stat UCL	2878

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 35.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chloroform

General Statistics

Total Number of Observations	14	Number of Distinct Observations	8
Number of Detects	1	Number of Non-Detects	13
Number of Distinct Detects	1	Number of Distinct Non-Detects	7

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Chloroform was not processed!

cis-1,2-Dichloroethene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	9
Number of Detects	9	Number of Non-Detects	5

Number of Distinct Detects	8	Number of Distinct Non-Detects	1
Minimum Detect	1	Minimum Non-Detect	0.4
Maximum Detect	2000	Maximum Non-Detect	0.4
Variance Detects	426548	Percent Non-Detects	35.71%
Mean Detects	274.5	SD Detects	653.1
Median Detects	6.3	CV Detects	2.379
Skewness Detects	2.898	Kurtosis Detects	8.525
Mean of Logged Detects	2.85	SD of Logged Detects	2.733

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.489	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.416	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	176.6	KM Standard Error of Mean	144.8
KM SD	510.9	95% KM (BCA) UCL	459.1
95% KM (t) UCL	433.1	95% KM (Percentile Bootstrap) UCL	448.1
95% KM (z) UCL	414.8	95% KM Bootstrap t UCL	1831
90% KM Chebyshev UCL	611	95% KM Chebyshev UCL	807.8
97.5% KM Chebyshev UCL	1081	99% KM Chebyshev UCL	1618

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.761	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.825	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.259	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.304	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.256	k star (bias corrected MLE)	0.245
Theta hat (MLE)	1073	Theta star (bias corrected MLE)	1122
nu hat (MLE)	4.606	nu star (bias corrected)	4.404
Mean (detects)	274.5		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	176.5
Maximum	2000	Median	1.5
SD	530.2	CV	3.005
k hat (MLE)	0.154	k star (bias corrected MLE)	0.168
Theta hat (MLE)	1149	Theta star (bias corrected MLE)	1048

nu hat (MLE)	4.301	nu star (bias corrected)	4.713
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (4.71, α)	1.022	Adjusted Chi Square Value (4.71, β)	0.817
95% Gamma Approximate UCL (use when n>=50)	813.8	95% Gamma Adjusted UCL (use when n<50)	1018

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	176.6	SD (KM)	510.9
Variance (KM)	260988	SE of Mean (KM)	144.8
k hat (KM)	0.119	k star (KM)	0.142
nu hat (KM)	3.346	nu star (KM)	3.962
theta hat (KM)	1478	theta star (KM)	1248
80% gamma percentile (KM)	182.9	90% gamma percentile (KM)	519
95% gamma percentile (KM)	982.6	99% gamma percentile (KM)	2345

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.96, α)	0.707	Adjusted Chi Square Value (3.96, β)	0.55
95% Gamma Approximate KM-UCL (use when n>=50)	990	95% Gamma Adjusted KM-UCL (use when n<50)	1273

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.892	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	176.5	Mean in Log Scale	0.279
SD in Original Scale	530.2	SD in Log Scale	4.306
95% t UCL (assumes normality of ROS data)	427.4	95% Percentile Bootstrap UCL	448.2
95% BCA Bootstrap UCL	590.7	95% Bootstrap t UCL	1873
95% H-UCL (Log ROS)	1.212E+9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.505	KM Geo Mean	4.503
KM SD (logged)	2.743	95% Critical H Value (KM-Log)	6.203
KM Standard Error of Mean (logged)	0.778	95% H-UCL (KM -Log)	21724
KM SD (logged)	2.743	95% Critical H Value (KM-Log)	6.203
KM Standard Error of Mean (logged)	0.778		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	176.5	Mean in Log Scale	1.257
SD in Original Scale	530.2	SD in Log Scale	3.084
95% t UCL (Assumes normality)	427.5	95% H-Stat UCL	152244

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	1831	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	1273

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Ethyl- benzene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	7
Number of Detects	6	Number of Non-Detects	8
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	0.31	Minimum Non-Detect	0.4
Maximum Detect	130	Maximum Non-Detect	0.4
Variance Detects	2342	Percent Non-Detects	57.14%
Mean Detects	45.29	SD Detects	48.39
Median Detects	37	CV Detects	1.069
Skewness Detects	1.164	Kurtosis Detects	1.345
Mean of Logged Detects	2.573	SD of Logged Detects	2.411

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.21	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	19.59	KM Standard Error of Mean	10.68
KM SD	36.49	95% KM (BCA) UCL	37.61
95% KM (t) UCL	38.51	95% KM (Percentile Bootstrap) UCL	37.69
95% KM (z) UCL	37.16	95% KM Bootstrap t UCL	50.77
90% KM Chebyshev UCL	51.64	95% KM Chebyshev UCL	66.16
97.5% KM Chebyshev UCL	86.31	99% KM Chebyshev UCL	125.9

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.391	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.278	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.348	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.511	k star (bias corrected MLE)	0.366
Theta hat (MLE)	88.69	Theta star (bias corrected MLE)	123.6

nu hat (MLE)	6.127	nu star (bias corrected)	4.397
Mean (detects)	45.29		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	19.47
Maximum	130	Median	0.16
SD	37.93	CV	1.948
k hat (MLE)	0.179	k star (bias corrected MLE)	0.188
Theta hat (MLE)	108.7	Theta star (bias corrected MLE)	103.4
nu hat (MLE)	5.015	nu star (bias corrected)	5.274
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.27, α)	1.281	Adjusted Chi Square Value (5.27, β)	1.041
95% Gamma Approximate UCL (use when n>=50)	80.19	95% Gamma Adjusted UCL (use when n<50)	98.66

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	19.59	SD (KM)	36.49
Variance (KM)	1332	SE of Mean (KM)	10.68
k hat (KM)	0.288	k star (KM)	0.274
nu hat (KM)	8.064	nu star (KM)	7.67
theta hat (KM)	68	theta star (KM)	71.5
80% gamma percentile (KM)	29.3	90% gamma percentile (KM)	58.34
95% gamma percentile (KM)	92.2	99% gamma percentile (KM)	181.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.67, α)	2.545	Adjusted Chi Square Value (7.67, β)	2.171
95% Gamma Approximate KM-UCL (use when n>=50)	59.02	95% Gamma Adjusted KM-UCL (use when n<50)	69.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	19.74	Mean in Log Scale	0.219
SD in Original Scale	37.79	SD in Log Scale	2.908
95% t UCL (assumes normality of ROS data)	37.63	95% Percentile Bootstrap UCL	36.2
95% BCA Bootstrap UCL	43.44	95% Bootstrap t UCL	59.45
95% H-UCL (Log ROS)	16842		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.433	KM Geo Mean	1.543

KM SD (logged)	2.347	95% Critical H Value (KM-Log)	5.381
KM Standard Error of Mean (logged)	0.687	95% H-UCL (KM -Log)	804.8
KM SD (logged)	2.347	95% Critical H Value (KM-Log)	5.381
KM Standard Error of Mean (logged)	0.687		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	19.52	Mean in Log Scale	0.183
SD in Original Scale	37.91	SD in Log Scale	2.617
95% t UCL (Assumes normality)	37.46	95% H-Stat UCL	2748

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 38.51

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Tetrachloroethene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	10
Number of Detects	7	Number of Non-Detects	7
Number of Distinct Detects	7	Number of Distinct Non-Detects	3
Minimum Detect	0.38	Minimum Non-Detect	0.4
Maximum Detect	59	Maximum Non-Detect	16
Variance Detects	476	Percent Non-Detects	50%
Mean Detects	13.39	SD Detects	21.82
Median Detects	1.9	CV Detects	1.629
Skewness Detects	1.978	Kurtosis Detects	3.745
Mean of Logged Detects	1.174	SD of Logged Detects	1.935

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.693	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.329	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	6.961	KM Standard Error of Mean	4.527
KM SD	15.67	95% KM (BCA) UCL	14.84
95% KM (t) UCL	14.98	95% KM (Percentile Bootstrap) UCL	15.14

95% KM (z) UCL	14.41	95% KM Bootstrap t UCL	56.7
90% KM Chebyshev UCL	20.54	95% KM Chebyshev UCL	26.69
97.5% KM Chebyshev UCL	35.23	99% KM Chebyshev UCL	52

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.476	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.759	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.253	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.329	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.454	k star (bias corrected MLE)	0.355
Theta hat (MLE)	29.49	Theta star (bias corrected MLE)	37.75
nu hat (MLE)	6.356	nu star (bias corrected)	4.965
Mean (detects)	13.39		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	6.7
Maximum	59	Median	0.195
SD	16.37	CV	2.443
k hat (MLE)	0.203	k star (bias corrected MLE)	0.207
Theta hat (MLE)	33.01	Theta star (bias corrected MLE)	32.35
nu hat (MLE)	5.683	nu star (bias corrected)	5.798
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.80, α)	1.538	Adjusted Chi Square Value (5.80, β)	1.267
95% Gamma Approximate UCL (use when n>=50)	25.26	95% Gamma Adjusted UCL (use when n<50)	30.67

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	6.961	SD (KM)	15.67
Variance (KM)	245.6	SE of Mean (KM)	4.527
k hat (KM)	0.197	k star (KM)	0.203
nu hat (KM)	5.525	nu star (KM)	5.674
theta hat (KM)	35.28	theta star (KM)	34.35
80% gamma percentile (KM)	9.236	90% gamma percentile (KM)	21.06
95% gamma percentile (KM)	35.75	99% gamma percentile (KM)	76.11

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.67, α)	1.476	Adjusted Chi Square Value (5.67, β)	1.212
95% Gamma Approximate KM-UCL (use when n>=50)	26.77	95% Gamma Adjusted KM-UCL (use when n<50)	32.59

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.192	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.825	Mean in Log Scale	-0.266
SD in Original Scale	16.31	SD in Log Scale	2.12
95% t UCL (assumes normality of ROS data)	14.55	95% Percentile Bootstrap UCL	14.62
95% BCA Bootstrap UCL	18.17	95% Bootstrap t UCL	60.21
95% H-UCL (Log ROS)	130.5		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.166	KM Geo Mean	1.18
KM SD (logged)	1.649	95% Critical H Value (KM-Log)	3.978
KM Standard Error of Mean (logged)	0.484	95% H-UCL (KM -Log)	28.37
KM SD (logged)	1.649	95% Critical H Value (KM-Log)	3.978
KM Standard Error of Mean (logged)	0.484		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	7.481	Mean in Log Scale	0.21
SD in Original Scale	16.16	SD in Log Scale	1.946
95% t UCL (Assumes normality)	15.13	95% H-Stat UCL	96.46

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	56.7	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	32.59

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Vinyl chloride

General Statistics

Total Number of Observations	14	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	9
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	0.24	Minimum Non-Detect	0.2
Maximum Detect	510	Maximum Non-Detect	2
Variance Detects	49680	Percent Non-Detects	64.29%
Mean Detects	113.3	SD Detects	222.9
Median Detects	2	CV Detects	1.967

Skewness Detects	2.182	Kurtosis Detects	4.789
Mean of Logged Detects	1.947	SD of Logged Detects	3.093

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.621	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.407	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	40.6	KM Standard Error of Mean	39.11
KM SD	130.9	95% KM (BCA) UCL	113.2
95% KM (t) UCL	109.9	95% KM (Percentile Bootstrap) UCL	113.3
95% KM (z) UCL	104.9	95% KM Bootstrap t UCL	7648
90% KM Chebyshev UCL	157.9	95% KM Chebyshev UCL	211.1
97.5% KM Chebyshev UCL	284.8	99% KM Chebyshev UCL	429.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.446	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.756	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.321	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.384	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.254	k star (bias corrected MLE)	0.235
Theta hat (MLE)	445.3	Theta star (bias corrected MLE)	481.9
nu hat (MLE)	2.545	nu star (bias corrected)	2.351
Mean (detects)	113.3		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	40.47
Maximum	510	Median	0.01
SD	135.9	CV	3.357
k hat (MLE)	0.131	k star (bias corrected MLE)	0.151
Theta hat (MLE)	308.3	Theta star (bias corrected MLE)	268.4
nu hat (MLE)	3.676	nu star (bias corrected)	4.222
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (4.22, α)	0.811	Adjusted Chi Square Value (4.22, β)	0.637
95% Gamma Approximate UCL (use when n>=50)	210.6	95% Gamma Adjusted UCL (use when n<50)	268.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	40.6	SD (KM)	130.9
Variance (KM)	17131	SE of Mean (KM)	39.11
k hat (KM)	0.0962	k star (KM)	0.123
nu hat (KM)	2.695	nu star (KM)	3.451
theta hat (KM)	421.9	theta star (KM)	329.5
80% gamma percentile (KM)	36.68	90% gamma percentile (KM)	115.9
95% gamma percentile (KM)	230.9	99% gamma percentile (KM)	579.7

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.45, α)	0.518	Adjusted Chi Square Value (3.45, β)	0.394
95% Gamma Approximate KM-UCL (use when n>=50)	270.7	95% Gamma Adjusted KM-UCL (use when n<50)	355.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.257	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	40.47	Mean in Log Scale	-4.35
SD in Original Scale	135.9	SD in Log Scale	5.809
95% t UCL (assumes normality of ROS data)	104.8	95% Percentile Bootstrap UCL	109.5
95% BCA Bootstrap UCL	149.8	95% Bootstrap t UCL	9069
95% H-UCL (Log ROS)	2.293E+14		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.325	KM Geo Mean	0.723
KM SD (logged)	2.372	95% Critical H Value (KM-Log)	5.432
KM Standard Error of Mean (logged)	0.71	95% H-UCL (KM -Log)	428.7
KM SD (logged)	2.372	95% Critical H Value (KM-Log)	5.432
KM Standard Error of Mean (logged)	0.71		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	40.6	Mean in Log Scale	-0.621
SD in Original Scale	135.8	SD in Log Scale	2.692
95% t UCL (Assumes normality)	104.9	95% H-Stat UCL	1915

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	7648	a Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	355.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.

ATTACHMENT 3

ProUCL Output - Groundwater (VOC Plume Core), Potable Use Scenario

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Xylene, m,p-

General Statistics

Total Number of Observations	14	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	9
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.19	Minimum Non-Detect	0.8
Maximum Detect	570	Maximum Non-Detect	0.8
Variance Detects	49145	Percent Non-Detects	64.29%
Mean Detects	214.8	SD Detects	221.7
Median Detects	150	CV Detects	1.032
Skewness Detects	1.245	Kurtosis Detects	1.499
Mean of Logged Detects	3.945	SD of Logged Detects	3.213

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.913	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.215	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	76.85	KM Standard Error of Mean	46.88
KM SD	156.9	95% KM (BCA) UCL	152.3
95% KM (t) UCL	159.9	95% KM (Percentile Bootstrap) UCL	151.1
95% KM (z) UCL	154	95% KM Bootstrap t UCL	202.3
90% KM Chebyshev UCL	217.5	95% KM Chebyshev UCL	281.2
97.5% KM Chebyshev UCL	369.6	99% KM Chebyshev UCL	543.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.43	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.718	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.289	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.374	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.453	k star (bias corrected MLE)	0.314
Theta hat (MLE)	474.5	Theta star (bias corrected MLE)	683.3
nu hat (MLE)	4.528	nu star (bias corrected)	3.144
Mean (detects)	214.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	78.89
Maximum	570	Median	0.01
SD	162	CV	2.053
k hat (MLE)	0.145	k star (bias corrected MLE)	0.161
Theta hat (MLE)	545.9	Theta star (bias corrected MLE)	489.5
nu hat (MLE)	4.046	nu star (bias corrected)	4.513
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (4.51, α)	0.934	Adjusted Chi Square Value (4.51, β)	0.741
95% Gamma Approximate UCL (use when n>=50)	381.2	95% Gamma Adjusted UCL (use when n<50)	480.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	76.85	SD (KM)	156.9
Variance (KM)	24620	SE of Mean (KM)	46.88
k hat (KM)	0.24	k star (KM)	0.236
nu hat (KM)	6.717	nu star (KM)	6.611
theta hat (KM)	320.4	theta star (KM)	325.5
80% gamma percentile (KM)	109.2	90% gamma percentile (KM)	231.5
95% gamma percentile (KM)	378.3	99% gamma percentile (KM)	772.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.61, α)	1.96	Adjusted Chi Square Value (6.61, β)	1.642
95% Gamma Approximate KM-UCL (use when n>=50)	259.3	95% Gamma Adjusted KM-UCL (use when n<50)	309.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.76	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	77.69	Mean in Log Scale	0.498
SD in Original Scale	162.4	SD in Log Scale	3.787
95% t UCL (assumes normality of ROS data)	154.6	95% Percentile Bootstrap UCL	153.2
95% BCA Bootstrap UCL	180.7	95% Bootstrap t UCL	299.5
95% H-UCL (Log ROS)	14697223		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.341	KM Geo Mean	1.407
KM SD (logged)	3.188	95% Critical H Value (KM-Log)	7.139
KM Standard Error of Mean (logged)	0.953	95% H-UCL (KM -Log)	124973
KM SD (logged)	3.188	95% Critical H Value (KM-Log)	7.139
KM Standard Error of Mean (logged)	0.953		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	76.99	Mean in Log Scale	0.82
SD in Original Scale	162.8	SD in Log Scale	3.003
95% t UCL (Assumes normality)	154	95% H-Stat UCL	57054

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	159.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Xylene, o-

General Statistics

Total Number of Observations	14	Number of Distinct Observations	5
Number of Detects	4	Number of Non-Detects	10
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	14	Minimum Non-Detect	0.4
Maximum Detect	210	Maximum Non-Detect	0.4
Variance Detects	7044	Percent Non-Detects	71.43%
Mean Detects	92.25	SD Detects	83.93
Median Detects	72.5	CV Detects	0.91
Skewness Detects	1.259	Kurtosis Detects	2.015
Mean of Logged Detects	4.13	SD of Logged Detects	1.127

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.28	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	26.64	KM Standard Error of Mean	17.54
KM SD	56.84	95% KM (BCA) UCL	N/A
95% KM (t) UCL	57.71	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	55.5	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	79.27	95% KM Chebyshev UCL	103.1
97.5% KM Chebyshev UCL	136.2	99% KM Chebyshev UCL	201.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.215	**Anderson-Darling GOF Test**

5% A-D Critical Value	0.663	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.17	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.4	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.409	k star (bias corrected MLE)	0.519
Theta hat (MLE)	65.46	Theta star (bias corrected MLE)	177.8
nu hat (MLE)	11.27	nu star (bias corrected)	4.152
Mean (detects)	92.25		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	26.36
Maximum	210	Median	0.01
SD	59.12	CV	2.243
k hat (MLE)	0.144	k star (bias corrected MLE)	0.161
Theta hat (MLE)	183.5	Theta star (bias corrected MLE)	164.2
nu hat (MLE)	4.024	nu star (bias corrected)	4.495
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (4.49, α)	0.926	Adjusted Chi Square Value (4.49, β)	0.735
95% Gamma Approximate UCL (use when n>=50)	127.9	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	26.64	SD (KM)	56.84
Variance (KM)	3231	SE of Mean (KM)	17.54
k hat (KM)	0.22	k star (KM)	0.22
nu hat (KM)	6.151	nu star (KM)	6.166
theta hat (KM)	121.3	theta star (KM)	121
80% gamma percentile (KM)	36.78	90% gamma percentile (KM)	80.49
95% gamma percentile (KM)	133.8	99% gamma percentile (KM)	278.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.17, α)	1.725	Adjusted Chi Square Value (6.17, β)	1.433
95% Gamma Approximate KM-UCL (use when n>=50)	95.21	95% Gamma Adjusted KM-UCL (use when n<50)	114.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.971	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.232	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	27.61	Mean in Log Scale	0.831
SD in Original Scale	58.56	SD in Log Scale	2.69
95% t UCL (assumes normality of ROS data)	55.32	95% Percentile Bootstrap UCL	55.52
95% BCA Bootstrap UCL	68.2	95% Bootstrap t UCL	107
95% H-UCL (Log ROS)	8075		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.525	KM Geo Mean	1.691
KM SD (logged)	2.338	95% Critical H Value (KM-Log)	5.364
KM Standard Error of Mean (logged)	0.722	95% H-UCL (KM -Log)	844.1
KM SD (logged)	2.338	95% Critical H Value (KM-Log)	5.364
KM Standard Error of Mean (logged)	0.722		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	26.5	Mean in Log Scale	0.0303
SD in Original Scale	59.06	SD in Log Scale	2.744
95% t UCL (Assumes normality)	54.45	95% H-Stat UCL	5014

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 57.71

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Toluene

General Statistics

Total Number of Observations	14	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	9
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.18	Minimum Non-Detect	0.4
Maximum Detect	3500	Maximum Non-Detect	0.4
Variance Detects	2124663	Percent Non-Detects	64.29%
Mean Detects	1365	SD Detects	1458
Median Detects	1400	CV Detects	1.068
Skewness Detects	0.664	Kurtosis Detects	-0.378
Mean of Logged Detects	4.907	SD of Logged Detects	4.168

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level

Lilliefors Test Statistic	0.221	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	487.8	KM Standard Error of Mean	304
KM SD	1017	95% KM (BCA) UCL	989.8
95% KM (t) UCL	1026	95% KM (Percentile Bootstrap) UCL	952
95% KM (z) UCL	987.8	95% KM Bootstrap t UCL	1213
90% KM Chebyshev UCL	1400	95% KM Chebyshev UCL	1813
97.5% KM Chebyshev UCL	2386	99% KM Chebyshev UCL	3512

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.466	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.332	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.38	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.298	k star (bias corrected MLE)	0.253
Theta hat (MLE)	4575	Theta star (bias corrected MLE)	5403
nu hat (MLE)	2.985	nu star (bias corrected)	2.527
Mean (detects)	1365		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	494.8
Maximum	3500	Median	0.01
SD	1053	CV	2.127
k hat (MLE)	0.118	k star (bias corrected MLE)	0.14
Theta hat (MLE)	4203	Theta star (bias corrected MLE)	3532
nu hat (MLE)	3.296	nu star (bias corrected)	3.923
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (3.92, α)	0.692	Adjusted Chi Square Value (3.92, β)	0.537
95% Gamma Approximate UCL (use when n>=50)	2807	95% Gamma Adjusted UCL (use when n<50)	3615

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	487.8	SD (KM)	1017
Variance (KM)	1034988	SE of Mean (KM)	304
k hat (KM)	0.23	k star (KM)	0.228
nu hat (KM)	6.437	nu star (KM)	6.391
theta hat (KM)	2122	theta star (KM)	2137
80% gamma percentile (KM)	683.9	90% gamma percentile (KM)	1472

95% gamma percentile (KM)	2424	99% gamma percentile (KM)	4994

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.39, α)	1.843	Adjusted Chi Square Value (6.39, β)	1.538
95% Gamma Approximate KM-UCL (use when n>=50)	1692	95% Gamma Adjusted KM-UCL (use when n<50)	2027

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.829	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.313	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	488.9	Mean in Log Scale	0.503
SD in Original Scale	1055	SD in Log Scale	4.855
95% t UCL (assumes normality of ROS data)	988.3	95% Percentile Bootstrap UCL	971.9
95% BCA Bootstrap UCL	1123	95% Bootstrap t UCL	1581
95% H-UCL (Log ROS)	3.922E+11		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.65	KM Geo Mean	1.916
KM SD (logged)	3.877	95% Critical H Value (KM-Log)	8.601
KM Standard Error of Mean (logged)	1.158	95% H-UCL (KM -Log)	36512406
KM SD (logged)	3.877	95% Critical H Value (KM-Log)	8.601
KM Standard Error of Mean (logged)	1.158		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	487.8	Mean in Log Scale	0.718
SD in Original Scale	1056	SD in Log Scale	3.98
95% t UCL (Assumes normality)	987.5	95% H-Stat UCL	95940669

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL 1026

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Trichloroethene

General Statistics

ATTACHMENT 3

ProUCL Output - Groundwater (VOC Plume Core), Potable Use Scenario

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Total Number of Observations	14	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	9
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.29	Minimum Non-Detect	0.4
Maximum Detect	82	Maximum Non-Detect	40
Variance Detects	1256	Percent Non-Detects	64.29%
Mean Detects	36.22	SD Detects	35.44
Median Detects	37	CV Detects	0.978
Skewness Detects	0.226	Kurtosis Detects	-1.995
Mean of Logged Detects	2.377	SD of Logged Detects	2.42

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.227	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	13.4	KM Standard Error of Mean	7.708
KM SD	25.63	95% KM (BCA) UCL	24.75
95% KM (t) UCL	27.05	95% KM (Percentile Bootstrap) UCL	25.17
95% KM (z) UCL	26.08	95% KM Bootstrap t UCL	27.84
90% KM Chebyshev UCL	36.52	95% KM Chebyshev UCL	47
97.5% KM Chebyshev UCL	61.54	99% KM Chebyshev UCL	90.09

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.403	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.285	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.371	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.521	k star (bias corrected MLE)	0.342
Theta hat (MLE)	69.55	Theta star (bias corrected MLE)	106
nu hat (MLE)	5.207	nu star (bias corrected)	3.416
Mean (detects)	36.22		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	13.41
Maximum	82	Median	0.15
SD	26.46	CV	1.972

ATTACHMENT 3

ProUCL Output - Groundwater (VOC Plume Core), Potable Use Scenario

Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

k hat (MLE)	0.187	k star (bias corrected MLE)	0.195
Theta hat (MLE)	71.57	Theta star (bias corrected MLE)	68.83
nu hat (MLE)	5.248	nu star (bias corrected)	5.457
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (5.46, α)	1.369	Adjusted Chi Square Value (5.46, β)	1.118
95% Gamma Approximate UCL (use when n>=50)	53.47	95% Gamma Adjusted UCL (use when n<50)	65.46

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	13.4	SD (KM)	25.63
Variance (KM)	656.8	SE of Mean (KM)	7.708
k hat (KM)	0.273	k star (KM)	0.262
nu hat (KM)	7.652	nu star (KM)	7.346
theta hat (KM)	49.03	theta star (KM)	51.07
80% gamma percentile (KM)	19.78	90% gamma percentile (KM)	40.06
95% gamma percentile (KM)	63.92	99% gamma percentile (KM)	127

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.35, α)	2.362	Adjusted Chi Square Value (7.35, β)	2.005
95% Gamma Approximate KM-UCL (use when n>=50)	41.66	95% Gamma Adjusted KM-UCL (use when n<50)	49.09

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.86	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.295	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	13.31	Mean in Log Scale	0.0451
SD in Original Scale	26.47	SD in Log Scale	2.534
95% t UCL (assumes normality of ROS data)	25.84	95% Percentile Bootstrap UCL	25.83
95% BCA Bootstrap UCL	29.15	95% Bootstrap t UCL	40.31
95% H-UCL (Log ROS)	1497		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.119	KM Geo Mean	1.127
KM SD (logged)	2.175	95% Critical H Value (KM-Log)	5.029
KM Standard Error of Mean (logged)	0.665	95% H-UCL (KM -Log)	248.9
KM SD (logged)	2.175	95% Critical H Value (KM-Log)	5.029
KM Standard Error of Mean (logged)	0.665		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	14.61	Mean in Log Scale	0.308
SD in Original Scale	26.31	SD in Log Scale	2.448
95% t UCL (Assumes normality)	27.06	95% H-Stat UCL	1215

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	27.05

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ATTACHMENT 4

Non-detected Data Analysis: Fire Training Pit

Chemicals that were 100 percent (%) non-detected (ND) in a data grouping were not identified as COPCs for that data grouping; however, a qualitative evaluation of the 100 % ND chemicals within the Fire Training Pit (FTP) media was conducted. For this HHRA, the FTP media consisted of groundwater only.

Detection limits (DLs) and reporting limits (RLs) for chemicals that were 100 % ND were compared to groundwater screening levels (SLs). Groundwater SLs are the USEPA Regional Screening levels (RSLs) for tap water (USEPA, 2023) using an excess lifetime cancer risk (ELCR) of $1x10^{-6}$ and a hazard quotient (HQ) of 1. The FTP ND chemicals and a comparison of the ND DLs and RLs to SLs is provided in Attachment 4 (Table 1). ND chemicals exceeding SLs are identified and discussed below with regard to the frequency of exceedance and potential to be related to former site activities.

Non-detected Chemicals Exceeding Screening Levels

Four explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene), three metals (cadmium, chromium and mercury), 3 semi-volatile organic compounds ([SVOCs] 1,2,4-trichlorobenzene, 1,4-dichlorobenzene and hexachlorobutadiene), and 21 volatile organic compounds (VOCs) have RLs or DLs exceeding SLs at the FTP. Two ND explosives (2,4-dinitrotoluene and 2-nitrotoluene) and 4 ND VOCs (bromobenzene, bromochloromethane, chloromethane and chlorobenzene) had RLs that were greater than SLs but no DLs greater than SLs. ND explosives with RLs and/or DLs greater than SLs had a dataset of 10 samples per explosive. ND metals with RLs and/or DLs greater than SLs had a dataset of 13 samples per metal. ND SVOCs and VOCs with RLs and/or DLs greater than SLs had a dataset of 24 samples per analyte.

Three explosives (DNX, MNX and TNX), one SVOC (1,3-dichlorobenzene) and 3 VOCs (1,1-dichloropropene, 1-chlorohexane and 2,2-dichloropropane) were consistently ND in the FTP data set, but SLs were not available for these ND chemicals. Therefore, these ND chemicals were not included in the ND assessment process.

Non-detected Chemicals Related to Former Site Activities

To determine whether ND data exceeding SLs could potentially be related to former site activities, the historical IAAAP facility-wide dataset for the non-Formerly Utilized Sites Remedial Action Program (FUSRAP) sites was evaluated, and results are provided in Attachment 4 (Table 2). The ND comparison included historically detected chemicals in all media; however, surface water and sediment are not an issue/present at the FTP and soil is being addressed under the Operable Unit 1 Remedial Action.

- **ND Explosives**: 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene have been historically detected in groundwater, soil and surface water at IAAAP and, with the exception of 2-nitrotoluene, all have been historically detected in sediment at IAAAP. It is noted that DLs (ranging from 0.19 to 0.21 ug/L) and RLs (ranging from 0.19 to 0.42 ug/L) for the 4 explosives with RLs and 2 explosives with DLs greater than SLs are acceptably low for an explosives analysis. Additionally, when compared to the other ND explosives with DLs and RLs less than SLs, the SLs for the 4 ND explosives with DLs or RLs greater than SLs also have the lowest SLs for all the ND explosives. As a result, it is unlikely that any of the ND explosives are present in site groundwater.

- **ND Metals:** Cadmium, chromium and mercury have been historically detected in all media (groundwater, soil, surface water and sediment) at IAAAP.

One cadmium DL and one cadmium RL of the 13 available ground water samples were greater than the RSL. However, he maximum DL (2 ug/L) and maximum RL (2.5 ug/L) are less than the cadmium MCL of 5 ug/L. Therefore, even if cadmium were present in site groundwater at concentrations equivalent to the maxim RL, it would not be identified as a constituent of concern (COC). At the FTP, total chromium concentrations were conservatively assumed to be in the hexavalent form, and the hexavalent chromium SL was exceeded in all samples. However, the maximum total chromium DL of 40 ug/L and the maximum RL of 50 ug/L are less than the total chromium MCL of 100 ug/L. Therefore, even if chromium was present in site groundwater at concentrations at the maximum DL or maximum RL, chromium would still not be identified as a COC. Of the 13 groundwater samples available for mercury, only one sample had a DL (0.75 ug/L) and RL (1 ug/L) marginally greater than the SL of 0.63 ug/L. Based upon the low DLs and RLs available in the mercury groundwater dataset, and the fact that mercury was 100% ND with 90% of the dataset having DLs and RLs less than the SL, it is highly unlikely that mercury is present in site groundwater.

- **ND SVOCs**: 1,2,4-Trichlorobenzene, 1,4-dichlorobenzene and hexachlorobutadiene have all been historically detected in soil at IAAAP, but only 1,2,4-trichlorobenzene has been historically detected in groundwater at IAAAP, and none of the 3 ND SVOCs have been historically detected in surface water or sediment at IAAAP.

  The maximum DLs for 1,2,4-trichlorobenzene, 1,4-dichlorobenzene and hexachlorobenzene are 80 ug/L, 40 ug/L and 80 ug/L, respectively, while the maximum RLs for all three chemicals are 100 ug/L. However, it is noted that for 1,2,4-trichlorobenzene and hexachlorobutadiene, 21 of 24 samples (88%) have a DL of 0.8 ug/L and a RL of 1 ug/L and that for 1,4-dichlorobenzene, 21 of 24 samples (88%) have a DL of 0.4 ug/L and a RL of 1 ug/L. The elevated DLs and RLs for these three ND SVOCs came from samples FTA-TT-MW-02-0319, FTA-TT-MW-03-0319 and SA-99-1-0319 (see Attachment 2 [FTP Analytical Data]). The locations (FTA-TT-MW-02, FTA-TT-MW-03 and SA-99-1) associated with ND SVOC samples with elevated DLs and RLs are also associated with relatively elevated VOC detections (See Attachment 1, Table 2.1 and Attachment 2). The elevated ND SVOC RLs and DLs are likely the result of chemical interferences from the elevated detected VOC concentrations at these three locations, and as demonstrated by 88% of ND SVOCs with RLs less than 1 ug/L, it is unlikely that any of the ND SVOCs with RLs and/or DLs greater than SLs are present in site groundwater.

- **ND VOCs**: Of the 21 ND VOCs with RLs and/or DLs greater than SLs, 9 have been historically detected in groundwater at IAAAP, 4 have been historically detected in soil at IAAAP, 5 have been historically detected in surface water at IAAAP, and one has been historically detected in sediment at IAAAP.

  Twenty-one of the ND VOCs had RLs greater than SLs, and 17 of the ND VOCs had DLs greater than SLs. There are 504 analytical results for the combined 21 ND VOCs with RLs and/or DLs greater than SLs (see Attachment 2). The DLs for these 21 ND VOCs range from 0.2 ug/L to 400 ug/L and RLs range from 1 ug/L to 500 ug/L. However, 441 of the 504 analytical results (88%) have RLs less than or equal to 5 ug/L and 452 of the 504 analytical results (90%) have DLs of 4 ug/L or less. Additionally, the sample locations with RLs greater than 5 ug/L are FTA-TT-MW-02, FTA-TT-MW-03 and SA-99-1. As indicated in Attachment 1, Table 2.1, the majority of the maximum detected VOC concentrations (18 of 21 maximum detects [86%]) came from FTA-TT-MW-02 or FTA-TT-MW-03, and as shown in Attachment 2 (FTP Analytical Data), for many of the detected VOCs, there were significant concentrations reported at SA-99-1. The elevated ND VOC RLs and DLs are likely the result of chemical interferences from the elevated detected VOC concentrations at these three locations, and as demonstrated by 88% of the ND results with RLs less than or equal to 5 ug/L and 90% of DLs less than or equal to 4 ug/L, it is unlikely that any of the ND VOCs with RLs and/or DLs greater than SLs are present in site groundwater.

Conclusions

Four explosives (2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-nitrotoluene and nitrobenzene), three metals (cadmium, chromium and mercury), 3 SVOCs, and 21 VOCs have RLs or DLs exceeding SLs at the FTP. Although the maximum DLs and/or RLs for these ND chemicals are greater than the SLs, based on the frequency of exceedance, comparison to historically detected chemicals in groundwater at IAAAP, and acceptably low DLs and RLs for most samples, further consideration of ND chemicals does not appear warranted in the FTP HHRA.

References

USEPA. 2023. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* May.

ATTACHMENT 4, TABLE 1
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
Explosives	99-35-4	1,3,5-Trinitrobenzene	ug/L	0 / 10	0.39	0.42	0.96	1.1	590	0	0
Explosives	99-65-0	1,3-Dinitrobenzene	ug/L	0 / 10	0.19	0.21	0.39	0.42	2	0	0
Explosives	118-96-7	2,4,6-Trinitrotoluene	ug/L	0 / 10	0.39	0.42	0.39	0.42	2.5	0	0
Explosives	121-14-2	2,4-Dinitrotoluene	ug/L	0 / 10	0.19	0.21	0.39	0.42	0.24	0	10
Explosives	606-20-2	2,6-Dinitrotoluene	ug/L	0 / 10	0.19	0.21	0.19	0.21	0.049	10	10
Explosives	88-72-2	2-Nitrotoluene	ug/L	0 / 10	0.19	0.21	0.39	0.42	0.31	0	10
Explosives	99-08-1	3-Nitrotoluene	ug/L	0 / 10	0.39	0.42	0.39	0.42	1.7	0	0
Explosives	99-99-0	4-Nitrotoluene	ug/L	0 / 10	0.39	0.42	0.96	1.1	4.3	0	0
Explosives	DNX	DNX	ug/L	0 / 10	0.24	0.26	0.48	0.53	--	--	--
Explosives	5755-27-1	MNX	ug/L	0 / 10	0.28	0.31	0.48	0.53	--	--	--
Explosives	98-95-3	Nitrobenzene	ug/L	0 / 10	0.19	0.21	0.39	0.42	0.14	10	10
Explosives	479-45-8	Tetryl	ug/L	0 / 10	0.19	0.21	0.23	0.25	39	0	0
Explosives	13980-04-6	TNX	ug/L	0 / 10	0.24	0.26	0.48	0.53	--	--	--
Metals	7440-43-9	Cadmium	ug/L	0 / 13	0.4	2	0.5	2.5	1.8	1	1
Metals	7440-47-3	Chromium	ug/L	0 / 13	8	40	10	50	0.035	13	13
Metals	7439-92-1	Lead	ug/L	0 / 13	2	10	3	15	15	0	0
Metals	7439-97-6	Mercury	ug/L	0 / 13	0.15	0.75	0.2	1	0.63	1	1
Metals	7440-22-4	Silver	ug/L	0 / 13	1.8	9	2	10	94	0	0
SVOCs	120-82-1	1,2,4-Trichlorobenzene	ug/L	0 / 24	0.8	80	1	100	1.2	3	3
SVOCs	541-73-1	1,3-Dichlorobenzene	ug/L	0 / 24	0.4	40	1	100	--	--	--
SVOCs	106-46-7	1,4-Dichlorobenzene	ug/L	0 / 24	0.4	40	1	100	0.48	3	24
SVOCs	87-68-3	Hexachlorobutadiene	ug/L	0 / 24	0.8	80	1	100	0.14	24	24
VOCs	630-20-6	1,1,1,2-Tetrachloroethane	ug/L	0 / 24	0.8	80	1	100	0.57	24	24
VOCs	79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0 / 24	0.8	80	1	100	0.076	24	24
VOCs	563-58-6	1,1-Dichloropropene	ug/L	0 / 24	0.4	40	1	100	--	--	--
VOCs	87-61-6	1,2,3-Trichlorobenzene	ug/L	0 / 24	0.8	80	1	100	7	3	3
VOCs	96-18-4	1,2,3-Trichloropropane	ug/L	0 / 24	0.8	80	3	300	0.00075	24	24
VOCs	96-12-8	1,2-Dibromo-3-chloropropane	ug/L	0 / 24	1.6	160	5	500	0.00033	24	24
VOCs	106-93-4	1,2-Dibromoethane	ug/L	0 / 24	0.4	40	1	100	0.0075	24	24
VOCs	78-87-5	1,2-Dichloropropane	ug/L	0 / 24	0.4	40	1	100	0.85	3	24
VOCs	142-28-9	1,3-Dichloropropane	ug/L	0 / 24	0.2	20	1	100	370	0	0
VOCs	544-10-5	1-Chlorohexane	ug/L	0 / 24	0.4	40	1	100	--	--	--
VOCs	594-20-7	2,2-Dichloropropane	ug/L	0 / 24	0.8	80	1	100	--	--	--
VOCs	95-49-8	2-Chlorotoluene	ug/L	0 / 24	0.4	40	1	100	240	0	0
VOCs	591-78-6	2-Hexanone	ug/L	0 / 24	4	400	5	500	38	3	3
VOCs	108-86-1	Bromobenzene	ug/L	0 / 24	0.4	40	1	100	62	0	1
VOCs	74-97-5	Bromochloromethane	ug/L	0 / 24	0.2	20	1	100	83	0	1
VOCs	75-27-4	Bromodichloromethane	ug/L	0 / 24	0.4	40	1	100	0.13	24	24
VOCs	75-25-2	Bromoform	ug/L	0 / 24	1	100	1	100	3.3	3	3

ATTACHMENT 4, TABLE 1
Comparison of 100% Non-Detected Analyte Results to Screening Levels
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

Chemical Group	CAS Number	Parameter Name	Units	FOD	Minimum Detection Limit	Maximum Detection Limit	Minimum Reporting Limit	Maximum Reporting Limit	Screening Level (1)	Detection Limit Number of Exceedances	Reporting Limit Number of Exceedances
VOCs	74-83-9	Bromomethane	ug/L	0 / 24	0.8	80	2	200	7.5	3	3
VOCs	56-23-5	Carbon tetrachloride	ug/L	0 / 24	0.4	40	2	200	0.46	3	24
VOCs	74-87-3	Chloro methane	ug/L	0 / 24	0.8	80	2	200	190	0	1
VOCs	108-90-7	Chlorobenzene	ug/L	0 / 24	0.4	40	1	100	78	0	1
VOCs	10061-01-5	cis-1,3-Dichloropropene	ug/L	0 / 24	0.4	40	1	100	0.47	3	24
VOCs	124-48-1	Dibromochloromethane	ug/L	0 / 24	0.4	40	1	100	0.87	3	24
VOCs	74-95-3	Dibromomethane	ug/L	0 / 24	0.4	40	1	100	8.3	2	3
VOCs	75-71-8	Dichlorodifluoromethane	ug/L	0 / 24	0.8	80	2	200	200	0	0
VOCs	1634-04-4	Methyl tert-butyl ether (MTBE)	ug/L	0 / 24	0.8	80	5	500	14	2	3
VOCs	106-43-4	p-Chlorotoluene	ug/L	0 / 24	0.8	80	1	100	250	0	0
VOCs	100-42-5	Styrene	ug/L	0 / 24	0.8	80	1	100	1200	0	0
VOCs	98-06-6	tert-Butylbenzene	ug/L	0 / 24	0.4	40	1	100	690	0	0
VOCs	10061-02-6	trans-1,3-Dichloropropene	ug/L	0 / 24	0.4	40	1	100	0.47	3	24
VOCs	75-69-4	Trichlorofluoromethane (Freon 11)	ug/L	0 / 24	0.8	80	2	200	5200	0	0

Notes:
(1) Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (May 2023) - Tapwater. Concentrations based on non-carcinogenic health effects are based on HQ=1; carcinogenic effects are based on risk of 1E-06. Available: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
1,3-Dichloropropene was used as a surrogate for cis-1,3-Dichloropropene
1,3-Dichloropropene was used as a surrogate for trans-1,3-Dichloropropene
[2] The maximum detection limit and reporting limit were compared to the screening level.

FOD = frequency of detect
ug/L = microgram per liter
NA = not available

ATTACHMENT 4, TABLE 2
Historically Detected Chemicals at IAAAP
Iowa Army Ammunition Plant, Fire Training Pit, Middletown, Iowa

100% ND Chemical > SL	Detected in Groundwater	Detected in Soil	Detected in Surface Water	Detected in Sediment
2,4-Dinitrotoluene	X	X	X	X
2,6-Dinitrotoluene	X	X	X	X
2-Nitrotoluene	X	X	X	--
Nitrobenzene	X	X	X	X
Cadmium	X	X	X	X
Chromium	X	X	X	X
Mercury	X	X	X	X
1,2,4-Trichlorobenzene	X	X	--	--
1,4-Dichlorobenzene	--	X	--	--
Hexachlorobutadiene	--	X	--	--
1,1,1,2-Tetrachloroethane	--	--	--	--
1,1,2,2-Tetrachloroethane	X	X	--	X
1,2,3-Trichlorobenzene	--	--	--	--
1,2,3-Trichloropropane	--	--	--	--
1,2-Dibromo-3-chloropropane	--	--	--	--
1,2-Dibromoethane	--	--	--	--
1,2-Dichloropropane	X	X	--	--
2-Hexanone	--	--	--	--
Bromobenzene	--	--	--	--
Bromochloromethane	X	--	--	--
Bromodichloromethane	X	--	X	--
Bromoform	--	--	--	--
Bromomethane	X	--	X	--
Carbon tetrachloride	X	--	X	--
Chloro methane	X	X	X	--
Chlorobenzene	X	X	X	--
cis-1,3-Dichloropropene	--	--	--	--
Dibromochloromethane	--	--	--	--
Dibromomethane	--	--	--	--
Methyl tert-butyl ether (MTBE)	X	--	--	--
trans-1,3-Dichloropropene	--	--	--	--

X = chemical was historically detected
-- = chemical was not historically detected.

Appendix B
Data Quality Evaluations

Data Quality Evaluation Report

This report contains the Data Quality Evaluation for sediment and water samples collected April 20, 2018, through July 11, 2019, as part of the Remedial Investigation at the Iowa Army Ammunition Plant, Middletown, Iowa. The report evaluates whether the analytical data obtained in the investigation are of sufficient quality and quantity to accomplish the project objectives.

Abbreviations and Acronyms

DL	detection limit
FD	field duplicate
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
MS/MSD	matrix spike/matrix spike duplicate
PARCC	precision, accuracy, representativeness, completeness and comparability
PCB	polychlorinated biphenyl
QAPP	*Remedial Investigation at Iowa Army Ammunitions Plan, Middletown, Iowa* (CH2M 2017)
QC	quality control
RPD	relative percent difference
SDG	sample delivery group
SVOC	semivolatile organic compounds
TA	TestAmerica Laboratory
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compounds

1.0 Introduction

This Data Quality Evaluation Report contains an assessment of the quality and usability of analytical data from groundwater and soil samples collected at the Iowa Army Ammunition Plant, Middletown, Iowa project site.

The analytical work was conducted in accordance with the project-specific quality assurance project plan, Remedial Investigation at the Iowa Army Ammunition Plant, Middletown, Iowa (QAPP) (CH2M 2017).

The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability, and completeness (PARCC) as described in the QAPP. This report is intended as a general data quality assessment designed to summarize data issues.

1.1 Analytical Laboratories and Analytical Methods

The samples were collected and shipped via overnight carrier for the majority of the analyses to TestAmerica (TA) Laboratories at Arvada, Colorado; Sacramento, California and/or St. Louis, Missouri. Samples collected for hexavalent chromium were shipped to Eurofins Laboratory in Lancaster, Pennsylvania (TA is a subsidiary of Eurofins). The samples were analyzed by one or more of the methods listed below:

- Volatile organic compounds (VOCs) by USEPA Method SW8260B
- Metals by USEPA SW6020
- Mercury by USEPA SW7470A
- Hexavalent Chromium by USEPA 218.6
- Explosives by USEPA SW8330B
- Pentachlorophenol by USEPA SW8151A or SW8270-SIM
- Polychlorinated biphenyls (PCBs) by USEPA SW8082
- Dioxins/furans by USEPA SW8290

Sixty-five sample delivery groups (SDGs) were evaluated for data quality. Table 1 provides a listing of the SDGs, sample identifications and collection and analysis chronology associated with the project samples.

2.0 Field Sample Collection

The fieldwork was conducted between April 20, 2018, and July 11, 2019. Two hundred thirty groundwater samples, 3 soil samples, 15 groundwater field duplicates, (FD), one soil FD, were collected as part of the investigation.

Matrix spike/matrix spike duplicates (MS/MSD) and equipment blanks were collected at the required frequency for the sampling effort. Trip blanks were included with sample coolers containing VOCs as required per the QAPP. Table 2 includes a summary of the field samples collected by date.

3.0 Data Review and Validation Process

3.1 Data Validation Definition

Analytical data from this investigation were evaluated as described in the QAPP. One hundred percent of definitive analytical results were validated. The assessment of definitive data includes a review of the following laboratory summary forms as defined in the QAPP:

- Chain-of-custody documentation
- Holding time compliance
- Sample results and detection limit checks
- QC sample frequencies
- Blanks (method, field, calibration)
- Laboratory control sample recoveries
- Surrogate spike recoveries
- MS/MSD recoveries and precision
- Initial and continuing calibration summary information
- Internal Standards
- Tuning criteria
- Confirmation column criteria (where applicable) precision
- Interference check standards
- Field duplicate precision
- Serial dilutions
- Post digestion spikes
- Case narrative review, laboratory flagging review, and other method-specific criteria

3.2 Overall Data Validation Findings

An overall summary of the data validation is contained in the following sections and presented in Table 3. Table 3 is presented so that each validation flag applied to a method/matrix/analyte is shown, to provide the percentage of results impacted by a specific data quality condition or flag, with respect to the total results available for any target analyte/matrix. Only out-of-control conditions noted during the data validation are discussed in Table 3 and in the following subsections.

3.3 Results Detected Between the Detection Limit and Reporting Limit

Analytes that were detected at concentrations greater than the detection limit (DL), but less than the limit or quantitation (LOQ), were qualified as "J" per the QAPP to reflect the uncertainty associated with concentrations of analytical data between the DL and the LOQ. Non-detected sample results were reported to the limit of detection (LOD).

3.4 Holding Time

Overall, holding time criteria were met; however, there were a few exceptions:

- The holding time for sample preparation exceeded the criteria of 7 days for pentachlorophenol and/or explosives in three samples, indicating a possible low bias. The data were qualified as estimated detected and non-detected results and flagged “J/UJ”, respectively, in the associated samples.
- The analytical holding time of 40 days for explosives exceeded criteria in one groundwater sample, indicating a possible low bias. The associated result was qualified as an estimated detected result and flagged “J” in the sample.

The qualified results are shown in Table 4.

3.5 Matrix Spike/Matrix Spike Duplicate

MS/MSD samples were analyzed as required and accuracy and precision criteria were in control with the following exceptions:

- Several analytes were recovered less than the lower control limits in a few MS/MSDs associated with the hexavalent chromium, VOCs and explosives analyses in groundwater, indicating a possible low bias. The data were qualified as estimated detected and non-detected results and flagged “J/UJ”, respectively, in the respective parent samples. In addition, a few analytes were recovered greater than the upper control limits in the MS/MSDs, indicating a possible high bias. Detected results were qualified as estimated and flagged “J” in the parent sample. Non-detected results were not qualified.
- There were a few instances where the MS/MSDs exceeded criteria; however, the data were not qualified as the parent sample concentration was significantly greater than the spike concentration.
- The relative percent differences (RPD) for several analytes exceeded criteria in a few MS/MSDs for hexavalent chromium, VOCs, and explosives. The data were qualified as estimated detected and non-detected results and flagged “J/UJ”, respectively, in the associated parent samples.

Qualified results are shown in Table 5.

3.6 Postdigestion Spikes

Postdigestion spike (PDS) samples were analyzed as required and accuracy criteria were met with the following exceptions:

- Barium and/or manganese were recovered less than criteria in a few PDSs associated with the metals analysis, indicating a possible low bias. The data were qualified as estimated detected results and flagged “J” in the parent samples.

Qualified results are shown in Table 5.

3.7 Sample Quantitation

There were a few instances in the metals analysis where the dissolved concentration was greater than the total concentration and the RPD exceeded criteria. The data were qualified as estimated detected results and flagged “J” in the associated samples.

Due to laboratory error, a few analytes identified with estimated maximum potential concentrations (EMPC) were not qualified as non-detected results in the dioxin/furan analysis. The EMPC data were qualified as non-detected results and flagged “U” in the associated samples.

There are two explosive samples from Line 800, samples L800-G-58-0818 and L800-MW28-0818 where the laboratory case narrative detailed that the sample matrix had a significant interference in the analysis. The narrative stated that the results were considered potentially false positive or false negative data. All results for these two samples are flagged “J/UJ”.

Qualified results are shown in Table 5.

3.8 Surrogate Spikes

Surrogates were added to the samples for methods requiring their use and acceptance criteria were met with the following exceptions:

- The surrogates were recovered less than the lower control limit in several groundwater samples associated with the explosive analysis, indicating a possible low bias. In addition, is the surrogates were recovered less than the lower control limits in one soil sample associated with the PCB analysis. The data were qualified as estimated detected and non-detected results and flagged “J/UJ”.
- The surrogates were recovered greater than the upper control limit in several groundwater samples associated with the explosive analysis, indicating a possible high bias. Detected results were qualified as estimated and flagged “J”. Non-detected results were not qualified.

When surrogate spikes were out of control, reanalysis of the samples was performed to confirm the condition.

Qualified data are shown in Table 6.

3.9 Internal Standard

Internal standards were added to the samples for methods requiring their use and acceptance criteria were met with the following exceptions:

- One internal standard was out of control with a low bias in eight VOC samples. All associated results were qualified as estimated concentrations and flagged “J” in the respective samples.

The qualified results are shown in Table 7.

3.10 Confirmation

The RPD between the primary column and the confirmation column exceeded criteria for several analytes associated with the explosive analysis in groundwater. The results were qualified as estimated detected and non-detected concentrations and flagged “J/UJ”.

The qualified results are shown in Table 8.

3.11 Blanks

Method blanks and field blanks were analyzed as required and were free of contamination with the following exceptions:

- Several analytes were detected in a few VOC trip blanks and/or equipment blanks. The data were qualified as non-detected results and flagged “U” when the associated sample concentrations were less than five times (10× for common lab contaminants) the blank concentrations.
- Several analytes were detected in the method blanks associated with the dioxin/furans analysis. The data were qualified as non-detected results and flagged “U” when the associated sample concentrations were less than five times the blank concentrations.

Qualified results for blank contamination are shown in Table 9.

3.12 Sample Preservations

Five groundwater samples associated with the explosives analysis were received in a shipping cooler which exceeded the temperature requirements. The data were qualified as estimated detected and non-detected results and flagged "J/UJ".

Multiple samples associated with the VOC analysis were received with headspace in the sample container greater than 6mm. The data were qualified based on a sample integrity issue, estimated detected and non-detected results and flagged "J/UJ", respectively, in the associated samples.

Qualified results for temperature and headspace issues are shown in Table 9.

3.13 Field Duplicate

FDs were collected as required and precision criteria were met with the following exception:

- The RPD for DNX exceeded criteria in FD pair WBP-TTMW-11-0319/ WBP-TTMW-F11-0319. The results were qualified as estimated and flagged "J" in the FD pair.

Qualified results are shown in Table 10.

3.14 Laboratory Control Sample

LCS/LCSDs were analyzed as required and accuracy and precision criteria were met with the following exceptions:

- Several analytes were recovered less than the lower control limits in a few groundwater LCS/LCSDs associated with the explosives and VOC analyses, indicating a possible low bias. The data were qualified as estimated detected and non-detected results and flagged "J/UJ", respectively, in the associated samples. In addition, a few analytes associated with the dioxin/furan analysis were recovered greater than the upper control limit in one LCS, indicating a possible high bias. Detected results were qualified as estimated and flagged "J" in the associated samples.
- The RPDs for several analytes associated with the VOC and explosive methods exceeded criteria in several LCS/LCSDs. The data were qualified as estimated detected and non-detected results and flagged "J/UJ", respectively, in the associated samples.

Qualified results are shown in Table 11.

3.15 Calibrations

Initial and continuing calibration analyses were performed as required by the methods and acceptance criteria were met with the following exceptions:

- The percent difference (%D) for a few analytes were less than criteria in several VOC continuing calibration verification standards indicating a possible low bias. The data were qualified as estimated non-detected results and flagged "UJ" in the associated samples.

Qualified results are shown in Table 12.

4.0 Summary of Precision, Accuracy, Representativeness, Comparability, and Completeness

The quality of the field sampling efforts and laboratory results were evaluated for compliance with project data quality objectives through a review of overall PARCC. Procedures used to assess PARCC are in accordance with the respective analytical methods and the QAPP requirements.

4.1 Precision

Precision of the data were verified through the review of the field and laboratory data quality indicators that include: FD, LCS/LCSD, MS/MSD and confirmation RPDs. There were a few instances where samples were qualified for FD, LCS/LCSD, MS/MSD and/or confirmation RPD issues; however, overall precision was in control.

4.2 Accuracy

Accuracy of the data was verified through the review of the calibration data, LCS/LCSD, internal standard, surrogate, postdigestion spike and MS/MSD recoveries, as well as the evaluation of method/calibration/field blank data. Although a few analytes were qualified as estimated due to blank contamination, calibration, LCS, surrogate, internal standard, PDS and/or MS/MSD issues, overall accuracy was in control.

4.3 Representativeness

Sample data are representative of the site conditions at the time of sample collection. All samples were properly stored and preserved with the exception of a few explosive samples arriving at the laboratory with elevated cooler temperatures. Analytical data were predominantly reported from an analysis within the project-specified hold-time. Laboratory and field blank contamination was minimal and non-impacting overall to sample data.

4.4 Appropriateness of Reporting Limits

This project was designed to allow risk-based decisions to be made based on the results of common USEPA-approved analytical methodologies. Detection limits achieved are the best possible based on sample variables.

4.5 Comparability

Comparability of the data was verified through the use of standard USEPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.

4.6 Completeness

All results are usable for project objectives. There are no results rejected for project use. The completeness objective of 90 percent was met. Project completeness data are summarized in Table 13.

4.7 Conclusions

The data generated from sample analyses are of sufficient quality and quantity necessary for accomplishing project objectives. Sample results accurately indicate the presence and/or absence of target analyte contamination at sampled locations. Samples were collected and analyzed as specified in the project QAPP.

5.0 References

CH2M. 2017. *Environmental Remedial Investigation at the Iowa Army Ammunition Plant, Middletown, Iowa*.

U.S. Environmental Protection Agency (USEPA). 1997. SW-846 Test Methods for Evaluating Solid Waste, Latest Update. June

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMG	280-108850-1	JAW30-0418	SW8151A	4/20/2018	4/21/2018	4/30/2018	5/1/2018
		JAW31-0418	SW8151A	4/20/2018	4/21/2018	4/30/2018	5/1/2018
TAMC		JAW31-0418	SW8290	4/20/2018	4/21/2018	4/24/2018	5/1/2018
TAMG		LINE9-FD1	SW8151A	4/20/2018	4/21/2018	4/30/2018	5/1/2018
TAMQ	280-108898-1	CCLTTMW004-0418	SW8330B	4/23/2018	4/24/2018	4/28/2018	5/1/2018
		CCLTTMW004-0418	SW8330B	4/23/2018	4/24/2018	4/28/2018	5/10/2018
		CCLTTMW004-0418	SW8330B	4/23/2018	4/24/2018	5/3/2018	5/5/2018
		CCLTTMW004-0418	SW8330B	4/23/2018	4/24/2018	5/3/2018	5/11/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	4/26/2018	5/19/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/25/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/23/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/11/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	4/26/2018	5/2/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	4/26/2018	4/30/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	4/26/2018	4/28/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/17/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	4/26/2018	4/28/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	4/26/2018	4/30/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	4/26/2018	5/2/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	4/26/2018	5/19/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/11/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/17/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/23/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/25/2018
STL-SEA		JAW29-0418	SW8270-SIM	4/22/2018	4/24/2018	4/27/2018	5/21/2018
		L9MW1-0418	SW8270-SIM	4/21/2018	4/24/2018	4/27/2018	5/21/2018
		L9MW1-0418MS	SW8270-SIM	4/21/2018	4/24/2018	4/27/2018	5/24/2018
		L9MW1-0418SD	SW8270-SIM	4/21/2018	4/24/2018	4/27/2018	5/24/2018
		L9TTMW02-0418	SW8270-SIM	4/21/2018	4/24/2018	4/27/2018	5/21/2018
TAMC	280-108898-2	JAW29-0418	SW8290	4/22/2018	4/24/2018	7/9/2018	7/16/2018
		JAW29-0418	SW8290	4/22/2018	4/24/2018	7/9/2018	7/18/2018
		L9MW1-0418	SW8290	4/21/2018	4/24/2018	7/9/2018	7/16/2018
		L9MW1-0418	SW8290	4/21/2018	4/24/2018	7/9/2018	7/18/2018
		L9TTMW02-0418	SW8290	4/21/2018	4/24/2018	6/18/2018	7/3/2018
		L9TTMW02-0418	SW8290	4/21/2018	4/24/2018	6/18/2018	7/4/2018
TAMQ	280-108965-1	G47-0418	SW8330B	4/24/2018	4/25/2018	4/26/2018	5/2/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-108965-1	G47-0418	SW8330B	4/24/2018	4/25/2018	5/7/2018	5/11/2018
		G47-0418	SW8330B	4/24/2018	4/25/2018	4/26/2018	4/28/2018
		G47-0418	SW8330B	4/24/2018	4/25/2018	5/7/2018	5/17/2018
TAML	280-109029-1	CDL-EB1-0418	SW6020	4/25/2018	4/26/2018	5/3/2018	5/4/2018
		CDL-EB1-0418	SW7470A	4/25/2018	4/26/2018	5/4/2018	5/4/2018
		CDL-EB1-0418MS	SW7470A	4/25/2018	4/26/2018	5/4/2018	5/4/2018
		CDL-EB1-0418SD	SW7470A	4/25/2018	4/26/2018	5/4/2018	5/4/2018
TAMQ		CONTG-EB1-0418	SW8330B	4/25/2018	4/26/2018	5/2/2018	5/5/2018
		CONTG-EB1-0418	SW8330B	4/25/2018	4/26/2018	5/2/2018	5/10/2018
		CONTG-EB1-0418	SW8330B	4/25/2018	4/26/2018	5/14/2018	5/22/2018
		CONTG-EB1-0418	SW8330B	4/25/2018	4/26/2018	5/14/2018	5/25/2018
TAML		JAW09-0418	SW6020	4/25/2018	4/26/2018	5/3/2018	5/4/2018
		JAW09-0418	SW7470A	4/25/2018	4/26/2018	5/4/2018	5/4/2018
		JAW09-0418MS	SW6020	4/25/2018	4/26/2018	5/3/2018	5/4/2018
		JAW09-0418SD	SW6020	4/25/2018	4/26/2018	5/3/2018	5/4/2018
TAMG		LINE9-EB1-0418	SW8151A	4/25/2018	4/26/2018	4/30/2018	5/1/2018
TAMC		LINE9-EB1-0418	SW8290	4/25/2018	4/26/2018	5/15/2018	5/17/2018
		LINE9-EB1-0418	SW8290	4/25/2018	4/26/2018	5/15/2018	5/20/2018
	280-111315-1	5B-DP1-0618	SW8330B	6/21/2018	6/22/2018	6/27/2018	6/30/2018
		5B-DP2-0618	SW8330B	6/21/2018	6/22/2018	6/27/2018	6/30/2018
		EB01-0618	SW8330B	6/21/2018	6/22/2018	6/27/2018	6/30/2018
	280-112010-1	L3-DP1-2530-0718	SW8330B	7/13/2018	7/16/2018	7/19/2018	7/24/2018
TAML	280-113005-1	PDS-MW1-0818	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW1-0818	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW1-0818MS	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW1-0818MS	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW1-0818SD	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW1-0818SD	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW2-0818	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW2-0818	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW3-0818	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW3-0818	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW4-0818	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW4-0818	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
TAMC	280-113558-1	L3A-MW3A-0818	SW8330B	8/22/2018	8/23/2018	8/29/2018	9/11/2018
TAMQ		L3AP-MW1-0818	SW8260B	8/22/2018	8/23/2018	9/5/2018	9/5/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	280-113558-1	L3AP-MW1-0818	SW8330B	8/22/2018	8/23/2018	8/29/2018	9/11/2018
TAMQ		L3AP-MW1-0818MS	SW8260B	8/22/2018	8/23/2018	9/5/2018	9/5/2018
TAMC		L3AP-MW1-0818MS	SW8330B	8/22/2018	8/23/2018	8/29/2018	9/11/2018
TAMQ		L3AP-MW1-0818SD	SW8260B	8/22/2018	8/23/2018	9/5/2018	9/5/2018
TAMC		L3AP-MW1-0818SD	SW8330B	8/22/2018	8/23/2018	8/29/2018	9/11/2018
TAMQ		TB-2-082218	SW8260B	8/22/2018	8/23/2018	9/5/2018	9/5/2018
TAML	280-113889-1	CDL-JAW10-0818	SW6020	8/30/2018	9/1/2018	9/11/2018	9/18/2018
		CDL-JAW10-0818	SW7470A	8/30/2018	9/1/2018	9/10/2018	9/11/2018
		CDL-JAW10-0818MS	SW7470A	8/30/2018	9/1/2018	9/10/2018	9/11/2018
		CDL-JAW10-0818SD	SW7470A	8/30/2018	9/1/2018	9/10/2018	9/11/2018
		CDL-JAW8-0818	SW6020	8/30/2018	9/1/2018	9/11/2018	9/18/2018
		CDL-JAW8-0818	SW7470A	8/30/2018	9/1/2018	9/10/2018	9/11/2018
		CDL-JAW8-0818MS	SW6020	8/30/2018	9/1/2018	9/11/2018	9/18/2018
		CDL-JAW8-0818SD	SW6020	8/30/2018	9/1/2018	9/11/2018	9/18/2018
TAMQ	280-117127-1	TB-1118	SW8260B	11/16/2018	11/17/2018	11/28/2018	11/28/2018
	280-117127-2	L1-MW107-1118	SW8260B	11/16/2018	11/17/2018	11/28/2018	11/28/2018
		L1-MW107-EB-1118	SW8260B	11/16/2018	11/17/2018	11/28/2018	11/28/2018
	280-120959-1	EBP-MW15-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/18/2019
		EBP-MW15-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EBP-MW3-0319	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EBP-MW3-0319	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
		EBP-MW6-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EBP-MWF3-0319	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EBP-MWF3-0319	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EDA-2-0319	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EDA-2-0319	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/17/2019
		EDA-2-0319	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EDA-2-0319MS	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EDA-2-0319MS	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EDA-2-0319SD	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EDA-2-0319SD	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
		JAW-07-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
	280-120959-2	WBP-TTMW-01-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
		WBP-TTMW-02-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/18/2019
		WBP-TTMW-02-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
TAML		WPB-99-5-0319	SW6020	3/7/2019	3/8/2019	3/14/2019	3/20/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAML	280-120959-2	WPB-99-5-0319	SW7470A	3/7/2019	3/8/2019	3/15/2019	3/15/2019
TAMQ		WPB-99-5-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/18/2019
		WPB-99-5-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
TAML		WPB-99-5-0319MS	SW7470A	3/7/2019	3/8/2019	3/15/2019	3/15/2019
		WPB-99-5-0319SD	SW7470A	3/7/2019	3/8/2019	3/15/2019	3/15/2019
TAMQ	280-121028-1	FTP-MW1-0319	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/21/2019
		FTP-MW2-0319	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/21/2019
	280-121028-2	TB-01-030719	SW8260B	3/7/2019	3/9/2019	3/16/2019	3/16/2019
		WBP-TTMW-01-0319	SW8260B	3/7/2019	3/9/2019	3/16/2019	3/16/2019
		WBP-TTMW-01-0319	SW8260B	3/7/2019	3/9/2019	3/18/2019	3/18/2019
		WBP-TTMW-02-0319	SW8260B	3/7/2019	3/9/2019	3/16/2019	3/16/2019
		WBP-TTMW-02-0319	SW8260B	3/7/2019	3/9/2019	3/18/2019	3/18/2019
TAML	280-121028-3	EB-EBP-01-030819	SW6020	3/8/2019	3/9/2019	3/14/2019	3/20/2019
TAMQ		EB-EBP-01-030819	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/18/2019
		EB-EBP-01-030819	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/21/2019
		EBP-MW16-0319	SW8330B	3/7/2019	3/9/2019	3/12/2019	3/21/2019
TAML		EBP-MW2-0319	SW6020	3/7/2019	3/9/2019	3/14/2019	3/20/2019
TAMQ		EBP-MW2-0319	SW8330B	3/7/2019	3/9/2019	3/12/2019	3/21/2019
		EBP-MW7-0319	SW8330B	3/7/2019	3/9/2019	3/12/2019	3/21/2019
		EDA-1-0319	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/21/2019
	280-121068-1	EBP-MW13-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/18/2019
		EBP-MW13-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/21/2019
TAML		EBP-MW9-0319	SW6020	3/8/2019	3/12/2019	3/18/2019	3/26/2019
TAMQ		EBP-MW9-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/18/2019
		EBP-MW9-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/21/2019
TAML		FJAW-80-0319	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		FJAW-80-0319	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		FJAW-80-0319	SW8260B	3/9/2019	3/12/2019	3/22/2019	3/22/2019
		FJAW-80-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
		FTP-MW3-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/21/2019
		FTP-MW7-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		FTP-MW8-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		G-30-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/21/2019
TAML		JAW-58-0319	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-58-0319	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-58-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAML	280-121068-1	JAW-59-0319	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-59-0319	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-59-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		JAW-59-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/18/2019
		JAW-59-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
TAML		JAW-80-0319	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-80-0319	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-80-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		JAW-80-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
TAML		JAW-80-0319MS	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-80-0319MS	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-80-0319MS	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		JAW-80-0319MS	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
TAML		JAW-80-0319SD	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-80-0319SD	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-80-0319SD	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		JAW-80-0319SD	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
		TB-02-030819	SW8260B	3/8/2019	3/12/2019	3/20/2019	3/20/2019
		WBP-99-1-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		WBP-99-1-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
		WBP-99-1-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/18/2019
		WBP-TTMW-15-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/18/2019
		WBP-TTMW-15-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
TAML	280-121140-1	EB-LCBK-01-031219	SW6020	3/12/2019	3/15/2019	3/20/2019	4/2/2019
		EB-LCBK-01-031219	SW6020	3/12/2019	3/15/2019	4/2/2019	4/3/2019
		EB-LCBK-01-031219	SW7470A	3/12/2019	3/15/2019	3/21/2019	3/22/2019
		EB-LCBK-01-031219	SW7470A	3/12/2019	3/15/2019	3/26/2019	3/27/2019
TAMQ	280-121155-1	EB-WBP-01-031219	SW8260B	3/12/2019	3/15/2019	3/22/2019	3/22/2019
		EB-WBP-01-031219	SW8330B	3/12/2019	3/15/2019	3/28/2019	3/29/2019
		EB-WBP-01-031219	SW8330B	3/12/2019	3/15/2019	3/28/2019	3/31/2019
		EB-WBP-01-031219	SW8330B	3/12/2019	3/15/2019	3/18/2019	3/22/2019
		EB-WBP-01-031219	SW8330B	3/12/2019	3/15/2019	3/18/2019	3/23/2019
		EDA-SW01-0319	SW8260B	3/12/2019	3/15/2019	3/22/2019	3/22/2019
		EDA-SW01-0319	SW8330B	3/12/2019	3/15/2019	3/18/2019	3/23/2019
		EDA-SW01-0319	SW8330B	3/12/2019	3/15/2019	3/28/2019	3/29/2019
TAML		EDA-SW02-0319	SW6020	3/12/2019	3/15/2019	3/20/2019	4/2/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAML	280-121155-1	EDA-SW02-0319	SW6020	3/12/2019	3/15/2019	4/2/2019	4/4/2019
		EDA-SW02-0319	SW7470A	3/12/2019	3/15/2019	3/21/2019	3/22/2019
		EDA-SW02-0319	SW7470A	3/12/2019	3/15/2019	3/26/2019	3/27/2019
TAMQ		EDA-SW02-0319	SW8260B	3/12/2019	3/15/2019	3/22/2019	3/22/2019
		EDA-SW02-0319	SW8330B	3/12/2019	3/15/2019	3/18/2019	3/23/2019
		EDA-SW02-0319	SW8330B	3/12/2019	3/15/2019	3/28/2019	3/29/2019
		TB-03-031219	SW8260B	3/12/2019	3/15/2019	3/22/2019	3/22/2019
TAML	280-121391-1	EDA-SW04-0319	SW6020	3/19/2019	3/20/2019	3/22/2019	4/9/2019
		EDA-SW04-0319	SW6020	3/19/2019	3/20/2019	4/2/2019	4/3/2019
		EDA-SW04-0319	SW7470A	3/19/2019	3/20/2019	3/26/2019	3/27/2019
TAMQ		EDA-SW04-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
TAML		EDA-SW04-0319MS	SW6020	3/19/2019	3/20/2019	3/22/2019	4/9/2019
		EDA-SW04-0319SD	SW6020	3/19/2019	3/20/2019	3/22/2019	4/9/2019
TAMQ	280-121393-1	OU3-FSW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
		OU3-FSW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/1/2019
		OU3-FSW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/2/2019
		OU3-SW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
		OU3-SW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/1/2019
		OU3-SW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/2/2019
		OU3-SW02-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/2/2019
		OU3-SW02-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/1/2019
		OU3-SW02-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
		OU3-SW03-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/2/2019
		OU3-SW03-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
	280-121485-1	EDA-SW03-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		EDA-SW04-0319	SW8260B	3/19/2019	3/21/2019	3/28/2019	3/28/2019
		FTA-99-1-0319	SW8260B	3/19/2019	3/21/2019	3/28/2019	3/28/2019
		FTA-99-1-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		FTA-99-1-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/3/2019
		JAW-25-0319	SW8260B	3/19/2019	3/21/2019	3/28/2019	3/28/2019
		JAW-25-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/2/2019
		JAW-25-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		JAW-25-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/1/2019
		OU3-SW04-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		OU3-SW04-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/3/2019
		TB-03-031919	SW8260B	3/19/2019	3/21/2019	3/28/2019	3/28/2019

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Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121485-1	WBP-99-2-0319	SW8260B	3/19/2019	3/21/2019	3/29/2019	3/29/2019
		WBP-99-2-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		WBP-99-2-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/1/2019
		WBP-99-2-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/2/2019
		WBP-TTMW-12-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		WBP-TTMW-12-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/1/2019
		WBP-TTMW-12-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/2/2019
		WBP-TTMW-13-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		WBP-TTMW-14-0319	SW8260B	3/19/2019	3/21/2019	3/29/2019	3/29/2019
		WBP-TTMW-14-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		WBP-TTMW-14-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/2/2019
		WBP-TTMW-14-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/1/2019
TAML	280-121569-1	FTA-TT-MW-02-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		FTA-TT-MW-02-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
		FTP-MW4-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		FTP-MW4-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		FTP-MW4-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
		FTP-MW4-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/11/2019
TAML		FTP-MW4-0319MS	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		FTP-MW4-0319MS	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		FTP-MW4-0319MS	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/8/2019
		FTP-MW4-0319MS	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
TAML		FTP-MW4-0319SD	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		FTP-MW4-0319SD	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		FTP-MW4-0319SD	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
		FTP-MW4-0319SD	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/8/2019
TAML		JAW-60-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		JAW-60-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
		JAW-62-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		JAW-62-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
		JAW-63-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		JAW-63-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		JAW-63-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
TAML		SA-99-1-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		SA-99-1-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		SA-99-1-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/12/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121569-1	SA-99-1-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
TAML	280-121620-1	EB-FTA-01-032119	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		EB-FTA-01-032119	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		EB-FTA-01-032119	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		EB-FTA-01-032119	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/29/2019
		FTA-99-2-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTA-99-2-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/29/2019
		FTA-TT-MW-02-0319	SW8260B	3/21/2019	3/23/2019	4/3/2019	4/3/2019
TAML		FTA-TT-MW-03-0319	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		FTA-TT-MW-03-0319	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		FTA-TT-MW-03-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
TAML		FTA-TT-MW-04-0319	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		FTA-TT-MW-04-0319	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		FTA-TT-MW-04-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTA-TT-MW-04-0319	SW8260B	3/21/2019	3/23/2019	4/1/2019	4/1/2019
TAML		FTA-TT-MW-05-0319	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		FTA-TT-MW-05-0319	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		FTA-TT-MW-05-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTA-TT-MW-05-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/29/2019
		FTA-TT-MW-05-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/31/2019
TAML		FTA-TT-MW-F05-0319	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		FTA-TT-MW-F05-0319	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		FTA-TT-MW-F05-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTA-TT-MW-F05-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/29/2019
		FTA-TT-MW-F05-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/31/2019
		FTP-MW4-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTP-MW4-0319MS	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTP-MW4-0319SD	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
TAML		JAW-23-0319	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		JAW-23-0319	SW7470A	3/22/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		JAW-23-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-23-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/30/2019
		JAW-23-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/31/2019
		JAW-23-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	4/2/2019
TAML		JAW-24-0319	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		JAW-24-0319	SW7470A	3/22/2019	3/23/2019	3/29/2019	3/29/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121620-1	JAW-24-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-24-0319	SW8260B	3/22/2019	3/23/2019	4/1/2019	4/1/2019
		JAW-24-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
		JAW-24-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	4/2/2019
		JAW-60-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-60-0319	SW8260B	3/21/2019	3/23/2019	4/1/2019	4/1/2019
		JAW-61-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-62-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-63-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		SA-99-1-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		TB-FTA-032119	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
TAML		WBP-MW2-0319	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		WBP-MW2-0319	SW7470A	3/22/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		WBP-MW2-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		WBP-MW2-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	4/2/2019
		WBP-MW2-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
TAML		WBP-MW2-0319MS	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		WBP-MW2-0319SD	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		WBP-TTMW-03-0319	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		WBP-TTMW-03-0319	SW7470A	3/22/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		WBP-TTMW-03-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		WBP-TTMW-03-0319	SW8260B	3/22/2019	3/23/2019	4/3/2019	4/3/2019
		WBP-TTMW-03-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
		WBP-TTMW-03-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/31/2019
		WBP-TTMW-03-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	4/2/2019
		WBP-TTMW-04-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		WBP-TTMW-04-0319	SW8260B	3/22/2019	3/23/2019	4/1/2019	4/1/2019
		WBP-TTMW-04-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/31/2019
		WBP-TTMW-04-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
		WBP-TTMW-08-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		WBP-TTMW-08-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
		WBP-TTMW-08-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/31/2019
	280-121664-1	CDL-SD6-0319	SW8082	3/25/2019	3/26/2019	3/30/2019	4/10/2019
		CDL-SD7-0319	SW8082	3/25/2019	3/26/2019	3/30/2019	4/11/2019
		CDL-SD8-0319	SW8082	3/25/2019	3/26/2019	3/30/2019	4/11/2019
		CDL-SD8-0319MS	SW8082	3/25/2019	3/26/2019	3/30/2019	4/11/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121664-1	CDL-SD8-0319SD	SW8082	3/25/2019	3/26/2019	3/30/2019	4/11/2019
		CDL-SDF7-0319	SW8082	3/25/2019	3/26/2019	3/30/2019	4/10/2019
TAML		FTA-TT-MW-01-0319	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		FTA-TT-MW-01-0319	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		FTA-TT-MW-01-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
TAML		FTA-TT-MW-01-0319MS	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		FTA-TT-MW-01-0319MS	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
		FTA-TT-MW-01-0319SD	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		FTA-TT-MW-01-0319SD	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		FTP-MW1-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW2-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW3-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW5-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW6-R0319	SW8260B	3/24/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW6-R0319MS	SW8260B	3/24/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW6-R0319SD	SW8260B	3/24/2019	3/26/2019	4/2/2019	4/2/2019
		G-30-R0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		JAW-11-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/31/2019
		JAW-11-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-11-0319MS	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-11-0319SD	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-12-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-13-0319	SW8260B	3/24/2019	3/26/2019	4/2/2019	4/2/2019
		JAW-13-0319	SW8260B	3/24/2019	3/26/2019	4/3/2019	4/3/2019
		JAW-13-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-14-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	4/2/2019
		JAW-14-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		L1-MW103-0319	SW8330B	3/25/2019	3/26/2019	4/2/2019	4/13/2019
		L1-MW103-0319	SW8330B	3/25/2019	3/26/2019	4/2/2019	4/11/2019
		L1-MW103-0319	SW8330B	3/25/2019	3/26/2019	3/28/2019	4/11/2019
		L1-MW103-0319	SW8330B	3/25/2019	3/26/2019	3/28/2019	3/31/2019
		M-01-0319	SW8260B	3/24/2019	3/26/2019	4/3/2019	4/3/2019
		NBP-MW1-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		NBP-MW1-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	4/2/2019
		TB-WBP-0322219	SW8260B	3/22/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-99-4-0319	SW8330B	3/22/2019	3/26/2019	3/29/2019	4/5/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121664-1	WBP-99-4-0319	SW8330B	3/22/2019	3/26/2019	3/29/2019	4/11/2019
		WBP-99-5-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-99-5-R0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-99-6-0319	SW8260B	3/22/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-99-6-0319	SW8260B	3/22/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-99-6-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-99-6-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-99-6-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-99-6-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/10/2019
TAML		WBP-MW1-0319	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		WBP-MW1-0319	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		WBP-MW1-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-MW1-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-MW1-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-MW1-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-MW1-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-MW3-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-MW3-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-MW3-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-MW3-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-MW3-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-MW3-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-MW8-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-MW8-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/2/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/12/2019
TAML		WBP-MW9-0319	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		WBP-MW9-0319	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		WBP-MW9-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-MW9-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-MW9-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-MW9-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-MW9-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121664-1	WBP-MW9-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-05B-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-05B-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-05B-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-05B-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
TAML		WBP-TTMW-06-0319	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		WBP-TTMW-06-0319	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		WBP-TTMW-06-0319	SW8260B	3/24/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/2/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/12/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-10-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-TTMW-10-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-10-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-TTMW-10-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-10-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-11-0319	SW8260B	3/22/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-11-0319	SW8260B	3/22/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/2/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/12/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-F11-0319	SW8260B	3/22/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-TTMW-F11-0319	SW8260B	3/22/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/2/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/12/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/11/2019
	280-121734-1	EBP-MW13-R0319	SW8260B	3/25/2019	3/27/2019	4/3/2019	4/3/2019
		EBP-MW17-0319	SW8330B	3/25/2019	3/27/2019	3/28/2019	3/31/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121734-1	EBP-MW17-0319	SW8330B	3/25/2019	3/27/2019	4/2/2019	4/12/2019
		NBPLF-MW3-0319	SW8330B	3/25/2019	3/27/2019	3/28/2019	3/31/2019
		NBPLF-MW3-0319	SW8330B	3/25/2019	3/27/2019	3/28/2019	4/4/2019
		NBPLF-MW3-0319	SW8330B	3/25/2019	3/27/2019	4/2/2019	4/12/2019
		NBPLF-MW3-0319	SW8330B	3/25/2019	3/27/2019	4/2/2019	4/13/2019
		TB-EBP-032519	SW8260B	3/25/2019	3/27/2019	4/3/2019	4/3/2019
	280-123239-1	L3AP-TW19-01-3545-0419	SW8260B	4/29/2019	5/1/2019	5/9/2019	5/9/2019
		L3AP-TW19-01-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/20/2019
		L3AP-TW19-01-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/10/2019
		L3AP-TW19-01-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/17/2019
		L3AP-TW19-02-3545-0419	SW8260B	4/29/2019	5/1/2019	5/9/2019	5/9/2019
		L3AP-TW19-02-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/10/2019
		L3AP-TW19-02-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/14/2019
		L3AP-TW19-02-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/17/2019
		L3AP-TW19-02-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/20/2019
		L3AP-TW19-03-3545-0419	SW8260B	4/29/2019	5/1/2019	5/9/2019	5/9/2019
		L3AP-TW19-03-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/20/2019
		L3AP-TW19-03-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/10/2019
		L3AP-TW19-03-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/14/2019
		L3AP-TW19-03-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/17/2019
		TB-042919	SW8260B	4/29/2019	5/1/2019	5/9/2019	5/9/2019
	280-123244-1	L3A-TW19-01-1020-0419	SW8330B	4/28/2019	5/1/2019	5/3/2019	5/10/2019
		L3A-TW19-01-1020-0419	SW8330B	4/28/2019	5/1/2019	5/3/2019	5/14/2019
		L3A-TW19-01-1020-0419	SW8330B	4/28/2019	5/1/2019	5/11/2019	5/16/2019
		L3A-TW19-01-1020-0419	SW8330B	4/28/2019	5/1/2019	5/11/2019	5/21/2019
		L3A-TW19-02-1020-0419	SW8330B	4/27/2019	5/1/2019	5/3/2019	5/10/2019
		L3A-TW19-02-1020-0419	SW8330B	4/27/2019	5/1/2019	5/3/2019	5/14/2019
		L3A-TW19-02-1020-0419	SW8330B	4/27/2019	5/1/2019	5/11/2019	5/16/2019
		L3A-TW19-02-1020-0419	SW8330B	4/27/2019	5/1/2019	5/11/2019	5/21/2019
		L3A-TW19-03-1020-0419	SW8330B	4/27/2019	5/1/2019	5/11/2019	5/16/2019
		L3A-TW19-03-1020-0419	SW8330B	4/27/2019	5/1/2019	5/11/2019	5/21/2019
		L3A-TW19-03-1020-0419	SW8330B	4/27/2019	5/1/2019	5/3/2019	5/14/2019
		L3A-TW19-03-1020-0419	SW8330B	4/27/2019	5/1/2019	5/3/2019	5/10/2019
		L3A-TW19-04B-5060-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/14/2019
		L3A-TW19-04B-5060-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/17/2019
		L3A-TW19-04B-5060-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/21/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-123244-1	L3A-TW19-04B-5060-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/10/2019
	280-126174-1	L3A-TW19-04A-1525-0719	SW8330B	7/11/2019	7/12/2019	7/16/2019	7/17/2019
		L3A-TW19-04A-1525-0719	SW8330B	7/11/2019	7/12/2019	7/16/2019	7/18/2019
TAMC	320-39972-1	EB01-0518	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		G-40-0518	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		G-40-0518MS	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		G-40-0518SD	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		L2-MW8-0518	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		L2-MWF8-0518	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
	320-40651-1	CTATW001-0618	SW8330B	6/23/2018	6/26/2018	6/27/2018	6/30/2018
		CTATW002-0618	SW8330B	6/23/2018	6/26/2018	6/27/2018	6/30/2018
		CTATW003-0618	SW8330B	6/23/2018	6/26/2018	6/27/2018	6/30/2018
		CW-P-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/29/2018
		EDA-4-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/30/2018
		EDA-4-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	7/2/2018
		JAW-626-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/30/2018
		JAW-627-0618	SW8330B	6/25/2018	6/26/2018	6/27/2018	6/29/2018
		JAW-627-0618	SW8330B	6/25/2018	6/26/2018	6/27/2018	7/2/2018
		L2-MW11-0618	SW8330B	6/25/2018	6/26/2018	6/27/2018	6/29/2018
		NBPLF-MW1-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/29/2018
		NBPLF-MW5-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/29/2018
	320-41113-1	EBP-MW4-0718	SW8330B	7/12/2018	7/13/2018	7/19/2018	7/24/2018
		EBP-MW4-0718	SW8330B	7/12/2018	7/13/2018	7/19/2018	7/25/2018
		EBP-MW5-0718	SW8330B	7/12/2018	7/13/2018	7/19/2018	7/24/2018
		EBP-MW5-0718	SW8330B	7/12/2018	7/13/2018	7/19/2018	7/25/2018
	320-41393-1	5A-MW1-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		5A-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		5A-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/11/2018
		5A-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/14/2018
		5A-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/17/2018
		5A-MW5-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/11/2018
		5A-MW5-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/17/2018
		5A-MWF5-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/18/2018
		5A-MWF5-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/11/2018
		5B-MW1-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		5B-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-41393-1	5B-MW4-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/11/2018
		5B-MW4-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/20/2018
		JAW-606-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/14/2018
		JAW-607-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		JAW-608-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		JAW-608-0718	SW8330B	7/23/2018	7/24/2018	8/13/2018	8/19/2018
	320-41441-1	5A-MW3-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		5A-MW3-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/19/2018
		5B-MW3-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		5B-MW3-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/17/2018
		5B-MW3-0718MS	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/17/2018
		5B-MW3-0718MS	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		5B-MW3-0718SD	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/17/2018
		5B-MW3-0718SD	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		JAW-609-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		JAW-609-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/19/2018
		JAW-609F-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/19/2018
		JAW-609F-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/20/2018
	320-41445-1	5A-MW4-0718	SW8330B	7/20/2018	7/25/2018	7/26/2018	8/11/2018
		5A-MW6-0718	SW8330B	7/20/2018	7/25/2018	7/26/2018	8/11/2018
		L3-DP2-1520-0718	SW8330B	7/20/2018	7/25/2018	7/26/2018	8/11/2018
		L3-DP3-3438-0718	SW8330B	7/20/2018	7/25/2018	7/26/2018	8/11/2018
	320-41892-1	PDS-MW1-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/13/2018
		PDS-MW1-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
		PDS-MW1-0818MS	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW1-0818MS	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
		PDS-MW1-0818SD	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW1-0818SD	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
		PDS-MW2-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW3-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW3-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
		PDS-MW4-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW4-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
	320-42259-1	JAW-15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/29/2018
		JAW-15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/24/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42259-1	JAW-15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/30/2018
		JAW-16-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-16-0818MS	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-16-0818SD	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-17-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-17-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-17-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/29/2018
		JAW-17-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/31/2018
		JAW-19-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-19-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-20-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-20-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-21-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-21-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-22-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-22-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-22-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/29/2018
		JAW-22-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/30/2018
		JAW-F15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-F15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-F15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/29/2018
		JAW-F15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/30/2018
		L3A-EB1-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		L3A-EB1-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
TAMQ		L3AP-MW3-0818	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-MW3-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/26/2018
		L3AP-MW3-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/24/2018
TAMQ		TB-2-081718	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
	320-42263-1	L3AP-EB1-0818	SW8260B	8/16/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-EB1-0818	SW8330B	8/16/2018	8/18/2018	8/22/2018	8/31/2018
TAMQ		L3AP-FMW4-0818	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-FMW4-0818	SW8330B	8/17/2018	8/18/2018	8/22/2018	8/31/2018
TAMQ		L3AP-MW2-0818	SW8260B	8/16/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-MW2-0818	SW8330B	8/16/2018	8/18/2018	8/22/2018	8/31/2018
TAMQ		L3AP-MW4-0818	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-MW4-0818	SW8330B	8/17/2018	8/18/2018	8/22/2018	8/31/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42263-1	L3AP-MW4-0818	SW8330B	8/17/2018	8/18/2018	8/22/2018	8/30/2018
TAMQ		TB-1-081718	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
TAMC	320-42328-1	L800-FMW12-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-FMW12-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-G17-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/5/2018
		L800-G17-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-G17-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/7/2018
		L800-MW1-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW1-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/31/2018
		L800-MW1-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW12-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW12-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW13-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW13-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/5/2018
		L800-MW15-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW18-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW18-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW25-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW25-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/31/2018
		L800-MW25-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW26-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW4-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW4-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/7/2018
		L800-MW7-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/5/2018
		L800-MW7-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW8-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW9-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW9-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW9-0818MS	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW9-0818MS	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW9-0818SD	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW9-0818SD	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
	320-42437-1	L3A-MW1A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/12/2018
		L3A-MW1A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/13/2018
		L3A-MW1B-0818	SW8330B	8/21/2018	8/23/2018	8/28/2018	9/12/2018
		L3A-MW4A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/12/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42437-1	L3A-MW4A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/13/2018
		L3A-MW4B-0818	SW8330B	8/21/2018	8/23/2018	8/28/2018	9/12/2018
		L3A-MW4B-0818	SW8330B	8/21/2018	8/23/2018	8/28/2018	9/13/2018
		L3A-MW5A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/13/2018
		L3A-MW5A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/12/2018
	320-42445-1	L3A-MW3B-0818	SW8330B	8/22/2018	8/23/2018	8/27/2018	9/12/2018
		L3A-MW5B-0818	SW8330B	8/22/2018	8/23/2018	8/27/2018	9/13/2018
		L3A-MW5B-0818	SW8330B	8/22/2018	8/23/2018	8/27/2018	9/12/2018
		L800-G56-0818	SW8330B	8/20/2018	8/23/2018	8/27/2018	9/12/2018
		L800-MW14-0818	SW8330B	8/20/2018	8/23/2018	8/27/2018	9/12/2018
	320-42600-1	L800-MW29-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/13/2018
		L800-MW29-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/14/2018
		L800-MW29-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/4/2018
		L800-MW30-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/14/2018
		L800-MW30-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/15/2018
		L800-MW30-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/4/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/7/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/22/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/17/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/13/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/4/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/14/2018
		L800-MWF30-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/14/2018
		L800-MWF30-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/4/2018
		L800-MWF30-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/7/2018
	320-42602-1	JAW70-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	9/21/2018
		JAW70-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/3/2018
		JAW70-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/13/2018
		L2-MW4-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/3/2018
		L2-MW4-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	9/21/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/14/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/13/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/4/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/3/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/1/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/2/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42602-1	L800-MW20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	9/21/2018
		L800-MW20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/3/2018
	320-42611-1	G-45-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/7/2018
		L800-G-58-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/10/2018
		L800-G-58-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/8/2018
		L800-G-58-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/7/2018
		L800-G-58-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/11/2018
		L800-MW28-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/7/2018
		L800-MW28-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/8/2018
	320-42636-1	JAW-71-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	9/22/2018
		JAW-71-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/4/2018
		L2-A-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	9/22/2018
		L2-A-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/4/2018
		L2-MW9-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	9/22/2018
		L2-MW9-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/4/2018
	320-42639-1	L800-TTMW09-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/2/2018
		L800-TTMW09-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/4/2018
		L800-TTMW09-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/1/2018
		L800-TTMW09-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/6/2018
		L800-TTMW15-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	9/22/2018
		L800-TTMW15-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/2/2018
		L800-TTMW15-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/3/2018
	320-42660-1	L800-G-43-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-MW27-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-MW27-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-MW27-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	10/2/2018
		L800-MW27-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	10/20/2018
	320-42664-1	L800-TTMW18-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-TTMW18-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-TTMW18-0818MMS	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-TTMW18-0818MMS	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-TTMW18-0818MSD	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-TTMW18-0818MSD	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
	320-42666-1	CCL-TTMW002-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		CCL-TTMW002-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		JAW-73-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42666-1	JAW-73-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
	320-42670-1	L800-TTMW01-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-TTMW04-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-TTMW04-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
	320-42724-1	L3A-EB-083018	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		L3A-EB-083018	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		L3A-MW7-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
	320-42726-1	CCL-TTMW003-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		CCL-TTMW003-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		CCL-TTMW009-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		CCL-TTMW009-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
		L2-12-C-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		L2-12-C-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
		L2-JAW-74-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/22/2018
		L2-JAW-74-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
	320-42727-1	L2-12-F-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		L2-12-F-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
		L2-MW3-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
	320-42729-1	CCL-TTMW001-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		CCL-TTMW001-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		CCL-TTMW006-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		CCL-TTMW006-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		CCL-TTMW022-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
	320-42730-1	L3A-JAW-18-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		L3A-JAW-18-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		L3A-JAW-18-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/30/2018
		L3A-MW6A-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		L3A-MW6A-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/30/2018
		L3A-MW6B-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		L3A-MW6B-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/30/2018
	320-42739-1	L2-JAW-75-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/2/2018
		L2-JAW-75-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/7/2018
		L2-MW10-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/7/2018
		L2-MW10-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/2/2018
		L2-MW1-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/2/2018
		L2-MW1-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/7/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42739-1	L2-TTMW02-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/2/2018
		L2-TTMW02-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/7/2018
	320-45351-1	G-14-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		G-14-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		GZ-3-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		GZ-3-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		JAW-40-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-40-1118	SW8330B	11/15/2018	11/16/2018	2/7/2019	2/8/2019
		JAW42-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/2/2018
		JAW42-1118	SW8330B	11/15/2018	11/16/2018	12/11/2018	12/24/2018
		JAW-47-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-47-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/22/2019
		JAW-47-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		JAW-52-1118	SW8330B	11/14/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-52-1118	SW8330B	11/14/2018	11/16/2018	12/27/2018	1/21/2019
		JAW-52-1118	SW8330B	11/14/2018	11/16/2018	12/27/2018	1/23/2019
		JAW-52-1118MS	SW8330B	11/14/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-52-1118SD	SW8330B	11/14/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-52-EB-1118	SW8330B	11/14/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-52-EB-1118	SW8330B	11/14/2018	11/16/2018	12/27/2018	1/21/2019
		JAW-52-EB-1118	SW8330B	11/14/2018	11/16/2018	12/27/2018	1/23/2019
		L1-MW102-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-MW102-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-MW102-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/22/2019
		L1-MW102-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-MW104-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-MW104-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-MW104-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-MW-105-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-MW-105-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-MW106-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/21/2019
		L1-MW106-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-MW106-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-MW106-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-TTMW-100-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-TTMW-100-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-45351-1	L1-TTMW-100-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/22/2019
		L1-TTMW-100-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-TTMW-101-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-TTMW-101-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/22/2019
		L1-TTMW-101-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-TTMW-101-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
	320-45381-1	GZ-2-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/24/2019
		GZ-2-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/22/2018
		GZ-2-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/23/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/26/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/28/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/27/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/24/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/23/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/14/2018
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/22/2018
		JAW-41-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/14/2018
		JAW-41-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/22/2018
		JAW-41-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/23/2019
		JAW-41-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/24/2019
		LI-MW107-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/22/2018
		LI-MW107-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/23/2019
		LI-MW107-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/24/2019
		LI-MW107-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/14/2018
LANC	WYC04	L3AP-EB1-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-FMW4-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW1-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW1-0818MS	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW1-0818SD	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW2-0818	E218.6	8/21/2018	8/27/2018		9/4/2018
		L3AP-MW3-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW4-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
	WYC05	CCL-TTMW002-0818	E218.6	8/29/2018	8/30/2018		9/5/2018
	WYC06	CCL-TTMW001-0818	E218.6	8/30/2018	8/31/2018		9/5/2018
		CCL-TTMW003-0818	E218.6	8/30/2018	8/31/2018		9/5/2018
		CCL-TTMW004-0818	E218.6	8/30/2018	8/31/2018		9/6/2018

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Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
LANC	WYC06	CCL-TTMW006-0818	E218.6	8/30/2018	8/31/2018		9/6/2018
		CCL-TTMW009-0818	E218.6	8/30/2018	8/31/2018		9/6/2018
		CCL-TTMW022-0818	E218.6	8/30/2018	8/31/2018		9/5/2018
	WYC09	EB-LCBK-01-031219	E218.6	3/12/2019	3/13/2019		3/19/2019
	WYC10	CCL-TW19-01-0818-0419	E218.6	4/24/2019	4/25/2019		4/30/2019
		CCL-TW19-01-0818-0419MS	E218.6	4/24/2019	4/25/2019		4/30/2019
		CCL-TW19-F1-0818-0419	E218.6	4/24/2019	4/25/2019		4/30/2019
	WYC11	L3AP-TW19-01-3545-0419	E218.6	4/29/2019	4/30/2019		5/9/2019
		L3AP-TW19-02-3545-0419	E218.6	4/29/2019	4/30/2019		5/9/2019
		L3AP-TW19-02-3545-0419MS	E218.6	4/29/2019	4/30/2019		5/9/2019
		L3AP-TW19-02-3545-0419SD	E218.6	4/29/2019	4/30/2019		5/9/2019
		L3AP-TW19-03-3545-0419	E218.6	4/29/2019	4/30/2019		5/9/2019

SDG = sample delivery group

LANC = Eurofins Lancaster

STL-SEA = <<<Undefined in tblLab>>>

TAMC = TestAmerica Sacramento

TAMG = <<<Undefined in tblLab>>>

TAML = TestAmerica St. Louis

TAMQ = TestAmerica Denver

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-108850-1	20-Apr-18	WATER	N	JAW30-0418	280-108850-1	TAMG
			N	JAW31-0418	280-108850-1	TAMC
			N	JAW31-0418	280-108850-1	TAMG
			FD	LINE9-FD1	280-108850-1	TAMG
280-108898-1	23-Apr-18	WATER	N	CCLTTMW004-0418	280-108898-1	TAMQ
	22-Apr-18		FD	CONTG-FD1	280-108898-1	TAMQ
			N	G15-0418	280-108898-1	TAMQ
			N	JAW29-0418	280-108898-1	STL-SEA
	21-Apr-18		N	L9MW1-0418	280-108898-1	STL-SEA
			MS	L9MW1-0418MS	280-108898-1	STL-SEA
			SD	L9MW1-0418SD	280-108898-1	STL-SEA
			N	L9TTMW02-0418	280-108898-1	STL-SEA
280-108898-2	22-Apr-18	WATER	N	JAW29-0418	280-108898-2	TAMC
	21-Apr-18		N	L9MW1-0418	280-108898-2	TAMC
			N	L9TTMW02-0418	280-108898-2	TAMC
280-108965-1	24-Apr-18	WATER	N	G47-0418	280-108965-1	TAMQ
280-109029-1	25-Apr-18	WATER	EB	CDL-EB1-0418	280-109029-1	TAML
			MS	CDL-EB1-0418MS	280-109029-1	TAML
			SD	CDL-EB1-0418SD	280-109029-1	TAML
			EB	CONTG-EB1-0418	280-109029-1	TAMQ
			N	JAW09-0418	280-109029-1	TAML
			MS	JAW09-0418MS	280-109029-1	TAML
			SD	JAW09-0418SD	280-109029-1	TAML
			EB	LINE9-EB1-0418	280-109029-1	TAMC
			EB	LINE9-EB1-0418	280-109029-1	TAMG
280-111315-1	21-Jun-18	WATER	N	5B-DP1-0618	280-111315-1	TAMC
			N	5B-DP2-0618	280-111315-1	TAMC
			EB	EB01-0618	280-111315-1	TAMC
280-112010-1	13-Jul-18	WATER	N	L3-DP1-2530-0718	280-112010-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-113005-1	06-Aug-18	WATER	N	PDS-MW1-0818	280-113005-1	TAML
			MS	PDS-MW1-0818MS	280-113005-1	TAML
			SD	PDS-MW1-0818SD	280-113005-1	TAML
			N	PDS-MW2-0818	280-113005-1	TAML
			N	PDS-MW3-0818	280-113005-1	TAML
			N	PDS-MW4-0818	280-113005-1	TAML
280-113558-1	22-Aug-18	WATER	N	L3A-MW3A-0818	280-113558-1	TAMC
			N	L3AP-MW1-0818	280-113558-1	TAMC
			N	L3AP-MW1-0818	280-113558-1	TAMQ
			MS	L3AP-MW1-0818MS	280-113558-1	TAMQ
			MS	L3AP-MW1-0818MS	280-113558-1	TAMC
			SD	L3AP-MW1-0818SD	280-113558-1	TAMC
			SD	L3AP-MW1-0818SD	280-113558-1	TAMQ
			TB	TB-2-082218	280-113558-1	TAMQ
280-113889-1	30-Aug-18	WATER	N	CDL-JAW10-0818	280-113889-1	TAML
			MS	CDL-JAW10-0818MS	280-113889-1	TAML
			SD	CDL-JAW10-0818SD	280-113889-1	TAML
			N	CDL-JAW8-0818	280-113889-1	TAML
			MS	CDL-JAW8-0818MS	280-113889-1	TAML
			SD	CDL-JAW8-0818SD	280-113889-1	TAML
280-117127-1	16-Nov-18	WATER	TB	TB-1118	280-117127-1	TAMQ
280-117127-2	16-Nov-18	WATER	N	L1-MW107-1118	280-117127-2	TAMQ
			EB	L1-MW107-EB-1118	280-117127-2	TAMQ
280-120959-1	07-Mar-19	WATER	N	EBP-MW15-0319	280-120959-1	TAMQ
	06-Mar-19		N	EBP-MW3-0319	280-120959-1	TAML
			N	EBP-MW3-0319	280-120959-1	TAMQ
	07-Mar-19		N	EBP-MW6-0319	280-120959-1	TAMQ
	06-Mar-19		FD	EBP-MWF3-0319	280-120959-1	TAML
			FD	EBP-MWF3-0319	280-120959-1	TAMQ
			N	EDA-2-0319	280-120959-1	TAML

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-120959-1	06-Mar-19	WATER	N	EDA-2-0319	280-120959-1	TAMQ
			MS	EDA-2-0319MS	280-120959-1	TAML
			MS	EDA-2-0319MS	280-120959-1	TAMQ
			SD	EDA-2-0319SD	280-120959-1	TAML
			SD	EDA-2-0319SD	280-120959-1	TAMQ
	07-Mar-19		N	JAW-07-0319	280-120959-1	TAMQ
280-120959-2	07-Mar-19	WATER	N	WBP-TTMW-01-0319	280-120959-2	TAMQ
			N	WBP-TTMW-02-0319	280-120959-2	TAMQ
			N	WPB-99-5-0319	280-120959-2	TAML
			N	WPB-99-5-0319	280-120959-2	TAMQ
			MS	WPB-99-5-0319MS	280-120959-2	TAML
			SD	WPB-99-5-0319SD	280-120959-2	TAML
280-121026-1	08-Mar-19	WATER	N	FTP-MW1-0319	280-121028-1	TAMQ
			N	FTP-MW2-0319	280-121028-1	TAMQ
280-121028-2	07-Mar-19	WATER	TB	TB-01-030719	280-121028-2	TAMQ
			N	WBP-TTMW-01-0319	280-121028-2	TAMQ
			N	WBP-TTMW-02-0319	280-121028-2	TAMQ
280-121028-3	08-Mar-19	WATER	EB	EB-EBP-01-030819	280-121028-3	TAMQ
			EB	EB-EBP-01-030819	280-121028-3	TAML
	07-Mar-19		N	EBP-MW16-0319	280-121028-3	TAMQ
			N	EBP-MW2-0319	280-121028-3	TAML
			N	EBP-MW2-0319	280-121028-3	TAMQ
			N	EBP-MW7-0319	280-121028-3	TAMQ
	08-Mar-19		N	EDA-1-0319	280-121028-3	TAMQ
280-121068-1	08-Mar-19	WATER	N	EBP-MW13-0319	280-121068-1	TAMQ
			N	EBP-MW9-0319	280-121068-1	TAML
			N	EBP-MW9-0319	280-121068-1	TAMQ
	09-Mar-19		FD	FJAW-80-0319	280-121068-1	TAMQ
			FD	FJAW-80-0319	280-121068-1	TAML
	08-Mar-19		N	FTP-MW3-0319	280-121068-1	TAMQ

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121068-1	09-Mar-19	WATER	N	FTP-MW7-0319	280-121068-1	TAMQ
			N	FTP-MW8-0319	280-121068-1	TAMQ
	08-Mar-19		N	G-30-0319	280-121068-1	TAMQ
	09-Mar-19		N	JAW-58-0319	280-121068-1	TAML
			N	JAW-58-0319	280-121068-1	TAMQ
			N	JAW-59-0319	280-121068-1	TAML
			N	JAW-59-0319	280-121068-1	TAMQ
			N	JAW-80-0319	280-121068-1	TAML
			N	JAW-80-0319	280-121068-1	TAMQ
			MS	JAW-80-0319MS	280-121068-1	TAMQ
			MS	JAW-80-0319MS	280-121068-1	TAML
			SD	JAW-80-0319SD	280-121068-1	TAMQ
			SD	JAW-80-0319SD	280-121068-1	TAML
	08-Mar-19		TB	TB-02-030819	280-121068-1	TAMQ
	09-Mar-19		N	WBP-99-1-0319	280-121068-1	TAMQ
			N	WBP-TTMW-15-0319	280-121068-1	TAMQ
280-121140-1	12-Mar-19	WATER	EB	EB-LCBK-01-031219	280-121140-1	TAML
280-121155-1	12-Mar-19	WATER	EB	EB-WBP-01-031219	280-121155-1	TAMQ
			N	EDA-SW01-0319	280-121155-1	TAMQ
			N	EDA-SW02-0319	280-121155-1	TAML
			N	EDA-SW02-0319	280-121155-1	TAMQ
			TB	TB-03-031219	280-121155-1	TAMQ
280-121391-1	19-Mar-19	WATER	N	EDA-SW04-0319	280-121391-1	TAMQ
			N	EDA-SW04-0319	280-121391-1	TAML
			MS	EDA-SW04-0319MS	280-121391-1	TAML
			SD	EDA-SW04-0319SD	280-121391-1	TAML
280-121393-1	19-Mar-19	WATER	FD	OU3-FSW01-0319	280-121393-1	TAMQ
			N	OU3-SW01-0319	280-121393-1	TAMQ
			N	OU3-SW02-0319	280-121393-1	TAMQ
			N	OU3-SW03-0319	280-121393-1	TAMQ

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121485-1	19-Mar-19	WATER	N	EDA-SW03-0319	280-121485-1	TAMQ
			N	EDA-SW04-0319	280-121485-1	TAMQ
			N	FTA-99-1-0319	280-121485-1	TAMQ
			N	JAW-25-0319	280-121485-1	TAMQ
			N	OU3-SW04-0319	280-121485-1	TAMQ
			TB	TB-03-031919	280-121485-1	TAMQ
			N	WBP-99-2-0319	280-121485-1	TAMQ
			N	WBP-TTMW-12-0319	280-121485-1	TAMQ
			N	WBP-TTMW-13-0319	280-121485-1	TAMQ
			N	WBP-TTMW-14-0319	280-121485-1	TAMQ
280-121569-1	21-Mar-19	WATER	N	FTA-TT-MW-02-0319	280-121569-1	TAML
			N	FTP-MW4-0319	280-121569-1	TAML
			N	FTP-MW4-0319	280-121569-1	TAMQ
			MS	FTP-MW4-0319MS	280-121569-1	TAML
			MS	FTP-MW4-0319MS	280-121569-1	TAMQ
			SD	FTP-MW4-0319SD	280-121569-1	TAML
			SD	FTP-MW4-0319SD	280-121569-1	TAMQ
			N	JAW-60-0319	280-121569-1	TAML
			N	JAW-62-0319	280-121569-1	TAML
			N	JAW-63-0319	280-121569-1	TAML
			N	JAW-63-0319	280-121569-1	TAMQ
			N	SA-99-1-0319	280-121569-1	TAML
			N	SA-99-1-0319	280-121569-1	TAMQ
280-121620-1	21-Mar-19	WATER	EB	EB-FTA-01-032119	280-121620-1	TAML
			EB	EB-FTA-01-032119	280-121620-1	TAMQ
			N	FTA-99-2-0319	280-121620-1	TAMQ
			N	FTA-TT-MW-02-0319	280-121620-1	TAMQ
			N	FTA-TT-MW-03-0319	280-121620-1	TAML
			N	FTA-TT-MW-03-0319	280-121620-1	TAMQ
			N	FTA-TT-MW-04-0319	280-121620-1	TAMQ
			N	FTA-TT-MW-04-0319	280-121620-1	TAML

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121620-1	21-Mar-19	WATER	N	FTA-TT-MW-05-0319	280-121620-1	TAML
			N	FTA-TT-MW-05-0319	280-121620-1	TAMQ
			FD	FTA-TT-MW-F05-0319	280-121620-1	TAMQ
			FD	FTA-TT-MW-F05-0319	280-121620-1	TAML
			N	FTP-MW4-0319	280-121620-1	TAMQ
			MS	FTP-MW4-0319MS	280-121620-1	TAMQ
			SD	FTP-MW4-0319SD	280-121620-1	TAMQ
	22-Mar-19		N	JAW-23-0319	280-121620-1	TAML
			N	JAW-23-0319	280-121620-1	TAMQ
			N	JAW-24-0319	280-121620-1	TAML
			N	JAW-24-0319	280-121620-1	TAMQ
	21-Mar-19		N	JAW-60-0319	280-121620-1	TAMQ
			N	JAW-61-0319	280-121620-1	TAMQ
			N	JAW-62-0319	280-121620-1	TAMQ
			N	JAW-63-0319	280-121620-1	TAMQ
			N	SA-99-1-0319	280-121620-1	TAMQ
			TB	TB-FTA-032119	280-121620-1	TAMQ
	22-Mar-19		N	WBP-MW2-0319	280-121620-1	TAML
			N	WBP-MW2-0319	280-121620-1	TAMQ
			MS	WBP-MW2-0319MS	280-121620-1	TAML
			SD	WBP-MW2-0319SD	280-121620-1	TAML
			N	WBP-TTMW-03-0319	280-121620-1	TAML
			N	WBP-TTMW-03-0319	280-121620-1	TAMQ
			N	WBP-TTMW-04-0319	280-121620-1	TAMQ
			N	WBP-TTMW-08-0319	280-121620-1	TAMQ
280-121664-1	25-Mar-19	SOIL	N	CDL-SD6-0319	280-121664-1	TAMQ
			N	CDL-SD7-0319	280-121664-1	TAMQ
			N	CDL-SD8-0319	280-121664-1	TAMQ
			MS	CDL-SD8-0319MS	280-121664-1	TAMQ
			SD	CDL-SD8-0319SD	280-121664-1	TAMQ
			FD	CDL-SDF7-0319	280-121664-1	TAMQ

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121664-1	23-Mar-19	WATER	N	FTA-TT-MW-01-0319	280-121664-1	TAML
			N	FTA-TT-MW-01-0319	280-121664-1	TAMQ
			MS	FTA-TT-MW-01-0319MS	280-121664-1	TAML
			SD	FTA-TT-MW-01-0319SD	280-121664-1	TAML
			N	FTP-MW1-R0319	280-121664-1	TAMQ
			N	FTP-MW2-R0319	280-121664-1	TAMQ
			N	FTP-MW3-R0319	280-121664-1	TAMQ
			N	FTP-MW5-R0319	280-121664-1	TAMQ
	24-Mar-19		N	FTP-MW6-R0319	280-121664-1	TAMQ
			MS	FTP-MW6-R0319MS	280-121664-1	TAMQ
			SD	FTP-MW6-R0319SD	280-121664-1	TAMQ
	23-Mar-19		N	G-30-R0319	280-121664-1	TAMQ
	24-Mar-19		N	JAW-11-0319	280-121664-1	TAMQ
			MS	JAW-11-0319MS	280-121664-1	TAMQ
			SD	JAW-11-0319SD	280-121664-1	TAMQ
			N	JAW-12-0319	280-121664-1	TAMQ
			N	JAW-13-0319	280-121664-1	TAMQ
			N	JAW-14-0319	280-121664-1	TAMQ
	25-Mar-19		N	L1-MW103-0319	280-121664-1	TAMQ
	24-Mar-19		N	M-01-0319	280-121664-1	TAMQ
			N	NBP-MW1-0319	280-121664-1	TAMQ
	22-Mar-19		TB	TB-WBP-0322219	280-121664-1	TAMQ
			N	WBP-99-4-0319	280-121664-1	TAMQ
	23-Mar-19		N	WBP-99-5-R0319	280-121664-1	TAMQ
	22-Mar-19		N	WBP-99-6-0319	280-121664-1	TAMQ
	23-Mar-19		N	WBP-MW1-0319	280-121664-1	TAMQ
			N	WBP-MW1-0319	280-121664-1	TAML
			N	WBP-MW3-0319	280-121664-1	TAMQ
			N	WBP-MW8-0319	280-121664-1	TAMQ
			N	WBP-MW9-0319	280-121664-1	TAML
			N	WBP-MW9-0319	280-121664-1	TAMQ

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121664-1	23-Mar-19	WATER	N	WBP-TTMW-05B-0319	280-121664-1	TAMQ
			N	WBP-TTMW-06-0319	280-121664-1	TAML
			N	WBP-TTMW-06-0319	280-121664-1	TAMQ
	24-Mar-19		N	WBP-TTMW-06-0319	280-121664-1	TAMQ
	23-Mar-19		N	WBP-TTMW-10-0319	280-121664-1	TAMQ
	22-Mar-19		N	WBP-TTMW-11-0319	280-121664-1	TAMQ
			FD	WBP-TTMW-F11-0319	280-121664-1	TAMQ
280-121734-1	25-Mar-19	WATER	N	EBP-MW13-R0319	280-121734-1	TAMQ
			N	EBP-MW17-0319	280-121734-1	TAMQ
			N	NBPLF-MW3-0319	280-121734-1	TAMQ
			TB	TB-EBP-032519	280-121734-1	TAMQ
280-123239-1	29-Apr-19	WATER	N	L3AP-TW19-01-3545-0419	280-123239-1	TAMQ
			N	L3AP-TW19-02-3545-0419	280-123239-1	TAMQ
			N	L3AP-TW19-03-3545-0419	280-123239-1	TAMQ
			TB	TB-042919	280-123239-1	TAMQ
280-123244-1	28-Apr-19	WATER	N	L3A-TW19-01-1020-0419	280-123244-1	TAMQ
	27-Apr-19		N	L3A-TW19-02-1020-0419	280-123244-1	TAMQ
			N	L3A-TW19-03-1020-0419	280-123244-1	TAMQ
	29-Apr-19		N	L3A-TW19-04B-5060-0419	280-123244-1	TAMQ
280-126174-1	11-Jul-19	WATER	N	L3A-TW19-04A-1525-0719	280-126174-1	TAMQ
320-39972-1	31-May-18	WATER	EB	EB01-0518	320-39972-1	TAMC
			N	G-40-0518	320-39972-1	TAMC
			MS	G-40-0518MS	320-39972-1	TAMC
			SD	G-40-0518SD	320-39972-1	TAMC
			N	L2-MW8-0518	320-39972-1	TAMC
			FD	L2-MWF8-0518	320-39972-1	TAMC
320-40651-1	23-Jun-18	WATER	N	CTATW001-0618	320-40651-1	TAMC
			N	CTATW002-0618	320-40651-1	TAMC
			N	CTATW003-0618	320-40651-1	TAMC
	24-Jun-18		N	CW-P-0618	320-40651-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-40651-1	24-Jun-18	WATER	N	EDA-4-0618	320-40651-1	TAMC
			N	JAW-626-0618	320-40651-1	TAMC
	25-Jun-18		N	JAW-627-0618	320-40651-1	TAMC
			N	L2-MW11-0618	320-40651-1	TAMC
	24-Jun-18		N	NBPLF-MW1-0618	320-40651-1	TAMC
			N	NBPLF-MW5-0618	320-40651-1	TAMC
320-41113-1	12-Jul-18	WATER	N	EBP-MW4-0718	320-41113-1	TAMC
			N	EBP-MW5-0718	320-41113-1	TAMC
320-41393-1	23-Jul-18	WATER	N	5A-MW1-0718	320-41393-1	TAMC
			N	5A-MW2-0718	320-41393-1	TAMC
	22-Jul-18		N	5A-MW5-0718	320-41393-1	TAMC
			FD	5A-MWF5-0718	320-41393-1	TAMC
	23-Jul-18		N	5B-MW1-0718	320-41393-1	TAMC
			N	5B-MW2-0718	320-41393-1	TAMC
	22-Jul-18		N	5B-MW4-0718	320-41393-1	TAMC
			N	JAW-606-0718	320-41393-1	TAMC
	23-Jul-18		N	JAW-607-0718	320-41393-1	TAMC
			N	JAW-608-0718	320-41393-1	TAMC
320-41441-1	24-Jul-18	WATER	N	5A-MW3-0718	320-41441-1	TAMC
			N	5B-MW3-0718	320-41441-1	TAMC
			MS	5B-MW3-0718MS	320-41441-1	TAMC
			SD	5B-MW3-0718SD	320-41441-1	TAMC
			N	JAW-609-0718	320-41441-1	TAMC
			FD	JAW-609F-0718	320-41441-1	TAMC
320-41445-1	20-Jul-18	WATER	N	5A-MW4-0718	320-41445-1	TAMC
			N	5A-MW6-0718	320-41445-1	TAMC
			N	L3-DP2-1520-0718	320-41445-1	TAMC
			N	L3-DP3-3438-0718	320-41445-1	TAMC
320-41892-1	06-Aug-18	WATER	N	PDS-MW1-0818	320-41892-1	TAMC
			MS	PDS-MW1-0818MS	320-41892-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-41892-1	06-Aug-18	WATER	SD	PDS-MW1-0818SD	320-41892-1	TAMC
			N	PDS-MW2-0818	320-41892-1	TAMC
			N	PDS-MW3-0818	320-41892-1	TAMC
			N	PDS-MW4-0818	320-41892-1	TAMC
320-42259-1	17-Aug-18	WATER	N	JAW-15-0818	320-42259-1	TAMC
	16-Aug-18		N	JAW-16-0818	320-42259-1	TAMC
			MS	JAW-16-0818MS	320-42259-1	TAMC
			SD	JAW-16-0818SD	320-42259-1	TAMC
	17-Aug-18		N	JAW-17-0818	320-42259-1	TAMC
	16-Aug-18		N	JAW-19-0818	320-42259-1	TAMC
			N	JAW-20-0818	320-42259-1	TAMC
			N	JAW-21-0818	320-42259-1	TAMC
			N	JAW-22-0818	320-42259-1	TAMC
	17-Aug-18		FD	JAW-F15-0818	320-42259-1	TAMC
	16-Aug-18		EB	L3A-EB1-0818	320-42259-1	TAMC
	17-Aug-18		N	L3AP-MW3-0818	320-42259-1	TAMC
			N	L3AP-MW3-0818	320-42259-1	TAMQ
			TB	TB-2-081718	320-42259-1	TAMQ
320-42263-1	16-Aug-18	WATER	EB	L3AP-EB1-0818	320-42263-1	TAMC
			EB	L3AP-EB1-0818	320-42263-1	TAMQ
	17-Aug-18		FD	L3AP-FMW4-0818	320-42263-1	TAMC
			FD	L3AP-FMW4-0818	320-42263-1	TAMQ
	16-Aug-18		N	L3AP-MW2-0818	320-42263-1	TAMC
			N	L3AP-MW2-0818	320-42263-1	TAMQ
	17-Aug-18		N	L3AP-MW4-0818	320-42263-1	TAMQ
			N	L3AP-MW4-0818	320-42263-1	TAMC
			TB	TB-1-081718	320-42263-1	TAMQ
320-42328-1	18-Aug-18	WATER	FD	L800-FMW12-0818	320-42328-1	TAMC
	19-Aug-18		N	L800-G17-0818	320-42328-1	TAMC
	18-Aug-18		N	L800-MW1-0818	320-42328-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-42328-1	18-Aug-18	WATER	N	L800-MW12-0818	320-42328-1	TAMC
	19-Aug-18		N	L800-MW13-0818	320-42328-1	TAMC
			N	L800-MW15-0818	320-42328-1	TAMC
	18-Aug-18		N	L800-MW18-0818	320-42328-1	TAMC
			N	L800-MW25-0818	320-42328-1	TAMC
	19-Aug-18		N	L800-MW26-0818	320-42328-1	TAMC
			N	L800-MW4-0818	320-42328-1	TAMC
			N	L800-MW7-0818	320-42328-1	TAMC
			N	L800-MW8-0818	320-42328-1	TAMC
	18-Aug-18		N	L800-MW9-0818	320-42328-1	TAMC
			MS	L800-MW9-0818MS	320-42328-1	TAMC
			SD	L800-MW9-0818SD	320-42328-1	TAMC
320-42437-1	22-Aug-18	WATER	N	L3A-MW1A-0818	320-42437-1	TAMC
	21-Aug-18		N	L3A-MW1B-0818	320-42437-1	TAMC
	22-Aug-18		N	L3A-MW4A-0818	320-42437-1	TAMC
	21-Aug-18		N	L3A-MW4B-0818	320-42437-1	TAMC
	22-Aug-18		N	L3A-MW5A-0818	320-42437-1	TAMC
320-42445-1	22-Aug-18	WATER	N	L3A-MW3B-0818	320-42445-1	TAMC
			N	L3A-MW5B-0818	320-42445-1	TAMC
	20-Aug-18		N	L800-G56-0818	320-42445-1	TAMC
			N	L800-MW14-0818	320-42445-1	TAMC
320-42600-1	28-Aug-18	WATER	N	L800-MW29-0818	320-42600-1	TAMC
			N	L800-MW30-0818	320-42600-1	TAMC
			N	L800-MW31-0818	320-42600-1	TAMC
			FD	L800-MWF30-0818	320-42600-1	TAMC
320-42602-1	28-Aug-18	WATER	N	JAW70-0818	320-42602-1	TAMC
			N	L2-MW4-0818	320-42602-1	TAMC
			N	L800-G20-0818	320-42602-1	TAMC
			N	L800-MW20-0818	320-42602-1	TAMC
320-42611-1	27-Aug-18	WATER	N	G-45-0818	320-42611-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-42611-1	27-Aug-18	WATER	N	L800-G-58-0818	320-42611-1	TAMC
			N	L800-MW28-0818	320-42611-1	TAMC
320-42636-1	28-Aug-18	WATER	N	JAW-71-0818	320-42636-1	TAMC
			N	L2-A-0818	320-42636-1	TAMC
			N	L2-MW9-0818	320-42636-1	TAMC
320-42639-1	28-Aug-18	WATER	N	L800-TTMW09-0818	320-42639-1	TAMC
			N	L800-TTMW15-0818	320-42639-1	TAMC
320-42660-1	29-Aug-18	WATER	N	L800-G-43-0818	320-42660-1	TAMC
			N	L800-MW27-0818	320-42660-1	TAMC
320-42664-1	29-Aug-18	WATER	N	L800-TTMW18-0818	320-42664-1	TAMC
			MS	L800-TTMW18-0818MMS	320-42664-1	TAMC
			SD	L800-TTMW18-0818MSD	320-42664-1	TAMC
320-42666-1	29-Aug-18	WATER	N	CCL-TTMW002-0818	320-42666-1	TAMC
			N	JAW-73-0818	320-42666-1	TAMC
320-42670-1	29-Aug-18	WATER	N	L800-TTMW01-0818	320-42670-1	TAMC
			N	L800-TTMW04-0818	320-42670-1	TAMC
320-42724-1	30-Aug-18	WATER	EB	L3A-EB-083018	320-42724-1	TAMC
			N	L3A-MW7-0818	320-42724-1	TAMC
320-42726-1	30-Aug-18	WATER	N	CCL-TTMW003-0818	320-42726-1	TAMC
	29-Aug-18		N	CCL-TTMW009-0818	320-42726-1	TAMC
			N	L2-12-C-0818	320-42726-1	TAMC
			N	L2-JAW-74-0818	320-42726-1	TAMC
320-42727-1	29-Aug-18	WATER	N	L2-12-F-0818	320-42727-1	TAMC
			N	L2-MW3-0818	320-42727-1	TAMC
320-42729-1	30-Aug-18	WATER	N	CCL-TTMW001-0818	320-42729-1	TAMC
			N	CCL-TTMW006-0818	320-42729-1	TAMC
	29-Aug-18		N	CCL-TTMW022-0818	320-42729-1	TAMC
320-42730-1	30-Aug-18	WATER	N	L3A-JAW-18-0818	320-42730-1	TAMC
	29-Aug-18		N	L3A-MW6A-0818	320-42730-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-42730-1	29-Aug-18	WATER	N	L3A-MW6B-0818	320-42730-1	TAMC
320-42739-1	30-Aug-18	WATER	N	L2-JAW-75-0818	320-42739-1	TAMC
			N	L2-MW10-0818	320-42739-1	TAMC
			N	L2-MW1-0818	320-42739-1	TAMC
			N	L2-TTMW02-0818	320-42739-1	TAMC
320-45351-1	15-Nov-18	WATER	N	G-14-1118	320-45351-1	TAMC
			N	GZ-3-1118	320-45351-1	TAMC
			N	JAW-40-1118	320-45351-1	TAMC
			N	JAW42-1118	320-45351-1	TAMC
			N	JAW-47-1118	320-45351-1	TAMC
	14-Nov-18		N	JAW-52-1118	320-45351-1	TAMC
			MS	JAW-52-1118MS	320-45351-1	TAMC
			SD	JAW-52-1118SD	320-45351-1	TAMC
			EB	JAW-52-EB-1118	320-45351-1	TAMC
	15-Nov-18		N	L1-MW102-1118	320-45351-1	TAMC
			N	L1-MW104-1118	320-45351-1	TAMC
			N	L1-MW-105-1118	320-45351-1	TAMC
			N	L1-MW106-1118	320-45351-1	TAMC
			N	L1-TTMW-100-1118	320-45351-1	TAMC
			N	L1-TTMW-101-1118	320-45351-1	TAMC
320-45381-1	16-Nov-18	WATER	N	GZ-2-1118	320-45381-1	TAMC
			N	GZ-2A-1118	320-45381-1	TAMC
			N	JAW-41-1118	320-45381-1	TAMC
			N	LI-MW107-1118	320-45381-1	TAMC
WYC04	22-Aug-18	WATER	EB	L3AP-EB1-0818	WYC04	LANC
			FD	L3AP-FMW4-0818	WYC04	LANC
			N	L3AP-MW1-0818	WYC04	LANC
			MS	L3AP-MW1-0818MS	WYC04	LANC
			SD	L3AP-MW1-0818SD	WYC04	LANC
	21-Aug-18		N	L3AP-MW2-0818	WYC04	LANC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
WYC04	22-Aug-18	WATER	N	L3AP-MW3-0818	WYC04	LANC
			N	L3AP-MW4-0818	WYC04	LANC
WYC05	29-Aug-18	WATER	N	CCL-TTMW002-0818	WYC05	LANC
WYC06	30-Aug-18	WATER	N	CCL-TTMW001-0818	WYC06	LANC
			N	CCL-TTMW003-0818	WYC06	LANC
			N	CCL-TTMW004-0818	WYC06	LANC
			N	CCL-TTMW006-0818	WYC06	LANC
			N	CCL-TTMW009-0818	WYC06	LANC
			N	CCL-TTMW022-0818	WYC06	LANC
WYC09	12-Mar-19	WATER	EB	EB-LCBK-01-031219	WYC09	LANC
WYC10	24-Apr-19	WATER	N	CCL-TW19-01-0818-0419	WYC10	LANC
			MS	CCL-TW19-01-0818-0419MS	WYC10	LANC
			FD	CCL-TW19-F1-0818-0419	WYC10	LANC
WYC11	29-Apr-19	WATER	N	L3AP-TW19-01-3545-0419	WYC11	LANC
			N	L3AP-TW19-02-3545-0419	WYC11	LANC
			MS	L3AP-TW19-02-3545-0419MS	WYC11	LANC
			SD	L3AP-TW19-02-3545-0419SD	WYC11	LANC
			N	L3AP-TW19-03-3545-0419	WYC11	LANC

SDG = Sample delivery group
LANC = Eurofins Lancaster
STL-SEA = <<<Undefined in tblLab>>>
TAMC = TestAmerica Sacramento
TAMG = <<<Undefined in tblLab>>>
TAML = TestAmerica St. Louis
TAMQ = TestAmerica Denver

QAQC Type
EB = Equipment (Rinsate) Blank
FD = Field Duplicate
MS = Matrix Spike
N = Normal
SD = Matrix Spike Duplicate
TB = Trip Blank

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples
SOIL			
	SW8082		
		Aroclor-1016	4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1221 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1232 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1242 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1248 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1254 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1260 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

WATER

E218.6

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte					Number of Samples
WATER							
	E218.6						
		Hexavalent Chromium					17
Validation Flag Category: Matrix			1	J	Flags	(5.88%)	for Matrix spike RPD criteria exceedance
Validation Flag Category: Matrix			1	J	Flags	(5.88%)	for Matrix spike recovery greater than upper control limit
Validation Flag Category: Matrix			1	J	Flags	(5.88%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Matrix			1	J	Flags	(5.88%)	for Matrix spike duplicate recovery criteria greater than upper control limit
	SW6020						
		Barium					32
Validation Flag Category: Matrix			4	J	Flags	(12.50%)	for Post-Digestion Spike recovery less than the lower control limit
Validation Flag Category: Matrix			1	J	Flags	(3.13%)	for Post digestion spike failed
		Calcium					2
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Dissolved metal result greater than the total metal result
		Calcium, dissolved					2
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Dissolved metal result greater than the total metal result
		Magnesium					2
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Dissolved metal result greater than the total metal result
		Magnesium, dissolved					2
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Dissolved metal result greater than the total metal result
		Manganese					2
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Post-Digestion Spike recovery less than the lower control limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte					Number of Samples		
WATER									
	SW6020								
		Potassium					2		
Validation Flag Category:		Matrix	1	J	Flags	(50.00%)		for	Dissolved metal result greater than the total metal result
		Potassium, dissolved					2		
Validation Flag Category:		Matrix	1	J	Flags	(50.00%)		for	Dissolved metal result greater than the total metal result
		Sodium					2		
Validation Flag Category:		Matrix	1	J	Flags	(50.00%)		for	Dissolved metal result greater than the total metal result
		Sodium, dissolved					2		
Validation Flag Category:		Matrix	1	J	Flags	(50.00%)		for	Dissolved metal result greater than the total metal result
	SW8151A								
		Pentachlorophenol					3		
Validation Flag Category:		HoldingTime	3	UJ	Flags	(100.00%)		for	Holding time exceeded
	SW8260B								
		1,1,1,2-Tetrachloroethane					64		
Validation Flag Category:		Matrix	2	UJ	Flags	(3.13%)		for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)		for	Sample Integrity
		1,1,1-TCA					64		
Validation Flag Category:		InternalStandard	2	J	Flags	(3.13%)		for	Internal standard response less than lower control limit
Validation Flag Category:		Miscellaneous	13	UJ	Flags	(20.31%)		for	Sample Integrity
Validation Flag Category:		Miscellaneous	8	J	Flags	(12.50%)		for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		1,1,2,2-Tetrachloroethane		64				
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		1,1,2-TCA		64				
Validation Flag Category:		InternalStandard	1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity
		1,1,2-Trichloro-1,2,2-trifluoroethane		44				
Validation Flag Category:		Blank	4	U	Flags	(9.09%)	for	Trip blank concentration less than RL
Validation Flag Category:		InternalStandard	2	J	Flags	(4.55%)	for	Internal standard response less than lower control limit
Validation Flag Category:		LaboratoryControlSample	3	J	Flags	(6.82%)	for	LCSD RPD criteria exceeded
Validation Flag Category:		Matrix	1	J	Flags	(2.27%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:		Matrix	1	J	Flags	(2.27%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	8	UJ	Flags	(18.18%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	5	J	Flags	(11.36%)	for	Sample Integrity
		1,1-DCA		64				
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	10	UJ	Flags	(15.63%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	11	J	Flags	(17.19%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8260B

	1,1-DCE	63				
Validation Flag Category:	LaboratoryControlSample	4	J	Flags	(6.35%)	for LCSD RPD criteria exceeded
Validation Flag Category:	Matrix	1	UJ	Flags	(1.59%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix	1	J	Flags	(1.59%)	for Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix	1	J	Flags	(1.59%)	for Matrix spike recovery greater than upper control limit
Validation Flag Category:	Miscellaneous	15	UJ	Flags	(23.81%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	5	J	Flags	(7.94%)	for Sample Integrity
	1,1-Dichloropropene	64				
Validation Flag Category:	Matrix	1	UJ	Flags	(1.56%)	for Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix	1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous	21	UJ	Flags	(32.81%)	for Sample Integrity
	1,2,3-Trichlorobenzene	64				
Validation Flag Category:	Miscellaneous	21	UJ	Flags	(32.81%)	for Sample Integrity
	1,2,3-Trichloropropane	64				
Validation Flag Category:	Miscellaneous	21	UJ	Flags	(32.81%)	for Sample Integrity
	1,2,4-Trichlorobenzene	64				
Validation Flag Category:	Miscellaneous	21	UJ	Flags	(32.81%)	for Sample Integrity
	1,2,4-Trimethylbenzene	64				
Validation Flag Category:	InternalStandard	3	J	Flags	(4.69%)	for Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous	17	UJ	Flags	(26.56%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	4	J	Flags	(6.25%)	for Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples				
WATER							
	SW8260B						
		1,2-DCA	64				
Validation Flag Category:	Blank		1	U	Flags	(1.56%)	for Equipment blank concentration less than the RL
Validation Flag Category:	InternalStandard		1	J	Flags	(1.56%)	for Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for Sample Integrity
		1,2-DCB	64				
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for Sample Integrity
		1,2-Dibromo-3-chloropropane	64				
Validation Flag Category:	Calibration		9	UJ	Flags	(14.06%)	for Continuing calibration recovery less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for Sample Integrity
		1,2-Dibromoethane (EDB)	64				
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for Sample Integrity
		1,2-Dichloropropane	64				
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for Sample Integrity
		1,3,5-Trimethylbenzene	64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8260B

1,3-DCB		64				
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
1,3-Dichloropropane		64				
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
1,4-DCB		64				
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
1-Chlorohexane		64				
Validation Flag Category: InternalStandard	1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category: Miscellaneous	20	UJ	Flags	(31.25%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	1	J	Flags	(1.56%)	for	Sample Integrity
2,2-Dichloropropane		64				
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
2-Chlorotoluene		64				
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
2-Hexanone		64				
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8260B

4-Chlorotoluene		64				
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
Acetone		64				
Validation Flag Category: Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity
Benzene		64				
Validation Flag Category: InternalStandard	4	J	Flags	(6.25%)	for	Internal standard response less than lower control limit
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	13	UJ	Flags	(20.31%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	8	J	Flags	(12.50%)	for	Sample Integrity
Bromobenzene		64				
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
Bromochloromethane		64				
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
Bromodichloromethane		64				
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples					
WATER									
	SW8260B								
		Bromoform		64					
Validation Flag Category:		Calibration	9	UJ	Flags	(14.06%)	for	Continuing calibration recovery less than lower control limit	
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit	
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity	
		Bromomethane		64					
Validation Flag Category:		Calibration	15	UJ	Flags	(23.44%)	for	Continuing calibration recovery less than lower control limit	
Validation Flag Category:		InternalStandard	2	J	Flags	(3.13%)	for	Internal standard response less than lower control limit	
Validation Flag Category:		Miscellaneous	17	UJ	Flags	(26.56%)	for	Sample Integrity	
Validation Flag Category:		Miscellaneous	4	J	Flags	(6.25%)	for	Sample Integrity	
		Carbon disulfide		64					
Validation Flag Category:		InternalStandard	1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit	
Validation Flag Category:		LaboratoryControlSample	1	UJ	Flags	(1.56%)	for	LCS recovery less than lower control limit	
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance	
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike recovery less than lower control limit	
Validation Flag Category:		Matrix	2	UJ	Flags	(3.13%)	for	Matrix spike duplicate recovery criteria less than lower control limit	
Validation Flag Category:		Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity	
Validation Flag Category:		Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity	
		Carbon tetrachloride		64					
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit	
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity	

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8260B

Chlorobenzene 64

Validation Flag Category:	Matrix	1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous	21	UJ	Flags	(32.81%)	for Sample Integrity

Chloroethane 63

Validation Flag Category:	InternalStandard	1	J	Flags	(1.59%)	for Internal standard response less than lower control limit
Validation Flag Category:	Matrix	1	UJ	Flags	(1.59%)	for Matrix spike RPD criteria exceedance
Validation Flag Category:	Miscellaneous	19	UJ	Flags	(30.16%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	2	J	Flags	(3.17%)	for Sample Integrity

Chloroform 64

Validation Flag Category:	Blank	10	U	Flags	(15.63%)	for Equipment blank concentration greater than the RL
Validation Flag Category:	InternalStandard	3	J	Flags	(4.69%)	for Internal standard response less than lower control limit
Validation Flag Category:	Matrix	1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous	14	UJ	Flags	(21.88%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	7	J	Flags	(10.94%)	for Sample Integrity

Chloromethane 64

Validation Flag Category:	InternalStandard	1	J	Flags	(1.56%)	for Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous	18	UJ	Flags	(28.13%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	3	J	Flags	(4.69%)	for Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8260B							
		Cis-1,2-DCE	64					
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	13	UJ	Flags	(20.31%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	8	J	Flags	(12.50%)	for	Sample Integrity
		cis-1,3-Dichloropropene	64					
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Dibromochloromethane	64					
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Dibromomethane	64					
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Dichlorodifluoromethane	64					
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:		Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8260B

Ethylbenzene 64

Validation Flag Category:	InternalStandard	3	J	Flags	(4.69%)	for Internal standard response less than lower control limit
Validation Flag Category:	Matrix	1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous	15	UJ	Flags	(23.44%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	6	J	Flags	(9.38%)	for Sample Integrity

Hexachlorobutadiene 64

Validation Flag Category:	Miscellaneous	21	UJ	Flags	(32.81%)	for Sample Integrity

Isopropylbenzene 64

Validation Flag Category:	InternalStandard	2	J	Flags	(3.13%)	for Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous	19	UJ	Flags	(29.69%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	2	J	Flags	(3.13%)	for Sample Integrity

m,p-Xylene 64

Validation Flag Category:	InternalStandard	3	J	Flags	(4.69%)	for Internal standard response less than lower control limit
Validation Flag Category:	Matrix	1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous	17	UJ	Flags	(26.56%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	4	J	Flags	(6.25%)	for Sample Integrity

MEK (2-Butanone) 64

Validation Flag Category:	InternalStandard	1	J	Flags	(1.56%)	for Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous	20	UJ	Flags	(31.25%)	for Sample Integrity
Validation Flag Category:	Miscellaneous	1	J	Flags	(1.56%)	for Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8260B							
		Methyl tert-butyl ether (MTBE)	64					
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Methylene chloride	64					
Validation Flag Category:		Blank	2	U	Flags	(3.13%)	for	Equipment blank concentration less than the RL
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		MIBK (Methyl isobutyl ketone)	64					
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Naphthalene	64					
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Miscellaneous	18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	3	J	Flags	(4.69%)	for	Sample Integrity
		n-Butylbenzene	64					
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	3	J	Flags	(4.69%)	for	Sample Integrity
		n-Propylbenzene	64					
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	17	UJ	Flags	(26.56%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	4	J	Flags	(6.25%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		o-Xylene		64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for	Sample Integrity
		p-Isopropyltoluene		64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for	Sample Integrity
		sec-Butylbenzene		64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		2	UJ	Flags	(3.13%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		17	UJ	Flags	(26.56%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		4	J	Flags	(6.25%)	for	Sample Integrity
		Styrene		64				
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples				
WATER							
	SW8260B						
		TCE	64				
Validation Flag Category: InternalStandard			4	J	Flags	(6.25%)	for Internal standard response less than lower control limit
Validation Flag Category: Matrix			1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous			12	UJ	Flags	(18.75%)	for Sample Integrity
Validation Flag Category: Miscellaneous			9	J	Flags	(14.06%)	for Sample Integrity
		tert-Butylbenzene	64				
Validation Flag Category: Matrix			1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous			21	UJ	Flags	(32.81%)	for Sample Integrity
		Tetrachloroethene	64				
Validation Flag Category: InternalStandard			1	J	Flags	(1.56%)	for Internal standard response less than lower control limit
Validation Flag Category: Miscellaneous			16	UJ	Flags	(25.00%)	for Sample Integrity
Validation Flag Category: Miscellaneous			5	J	Flags	(7.81%)	for Sample Integrity
		Toluene	64				
Validation Flag Category: InternalStandard			3	J	Flags	(4.69%)	for Internal standard response less than lower control limit
Validation Flag Category: Matrix			1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous			17	UJ	Flags	(26.56%)	for Sample Integrity
Validation Flag Category: Miscellaneous			4	J	Flags	(6.25%)	for Sample Integrity
		trans-1,2-DCE	64				
Validation Flag Category: InternalStandard			2	J	Flags	(3.13%)	for Internal standard response less than lower control limit
Validation Flag Category: Matrix			1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous			18	UJ	Flags	(28.13%)	for Sample Integrity
Validation Flag Category: Miscellaneous			3	J	Flags	(4.69%)	for Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		trans-1,3-Dichloropropene		64				
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Trichlorofluoromethane		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Vinyl chloride		64				
Validation Flag Category:		InternalStandard	1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity
	SW8290							
		1,2,3,4,6,7,8,9-Octachlorodibenzofuran		4				
Validation Flag Category:		Blank	2	U	Flags	(50.00%)	for	Laboratory blank contamination less than the RL
		1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin		4				
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than 1/2 the RL
		1,2,3,4,6,7,8-Heptachlorodibenzofuran		4				
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	3	U	Flags	(75.00%)	for	Estimated Maximum Possible Concentration

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte						Number of Samples
WATER								
	SW8290							
		1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin						4
Validation Flag Category:	Blank		3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:	Matrix		2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration
		1,2,3,4,7,8,9-Heptachlorodibenzofuran						4
Validation Flag Category:	Blank		1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
		1,2,3,4,7,8-Hexachlorodibenzofuran						4
Validation Flag Category:	Blank		1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:	Matrix		2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration
		1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin						4
Validation Flag Category:	Blank		3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:	Blank		1	U	Flags	(25.00%)	for	Laboratory blank contamination less than 1/2 the RL
Validation Flag Category:	LaboratoryControlSample		2	J	Flags	(50.00%)	for	LCS recovery greater than upper control limit
Validation Flag Category:	Matrix		1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration
		1,2,3,6,7,8-Hexachlorodibenzofuran						4
Validation Flag Category:	Blank		1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
		1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin						4
Validation Flag Category:	Matrix		1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration
		1,2,3,7,8,9-Hexachlorodibenzofuran						4
Validation Flag Category:	Blank		3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:	Matrix		1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8290

1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin 4

Validation Flag Category: Matrix 1 U Flags (25.00%) for Estimated Maximum Possible Concentration

1,2,3,7,8-Pentachlorodibenzofuran 4

Validation Flag Category: Blank 1 U Flags (25.00%) for Laboratory blank contamination less than the RL

2,3,7,8-Tetrachlorodibenzo-p-dioxin 4

Validation Flag Category: Blank 2 U Flags (50.00%) for Laboratory blank contamination less than the RL

Validation Flag Category: Matrix 2 U Flags (50.00%) for Estimated Maximum Possible Concentration

Total HpCDD 4

Validation Flag Category: Blank 3 U Flags (75.00%) for Laboratory blank contamination less than the RL

Validation Flag Category: Blank 1 U Flags (25.00%) for Laboratory blank contamination less than 1/2 the RL

Validation Flag Category: Matrix 2 U Flags (50.00%) for Estimated Maximum Possible Concentration

Total HpCDF 4

Validation Flag Category: Blank 3 U Flags (75.00%) for Laboratory blank contamination less than the RL

Validation Flag Category: Matrix 3 U Flags (75.00%) for Estimated Maximum Possible Concentration

Total HxCDD 4

Validation Flag Category: Blank 3 U Flags (75.00%) for Laboratory blank contamination less than the RL

Validation Flag Category: Blank 1 U Flags (25.00%) for Laboratory blank contamination less than 1/2 the RL

Validation Flag Category: Matrix 2 U Flags (50.00%) for Estimated Maximum Possible Concentration

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8290

Total HxCDF			4			
Validation Flag Category: Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category: Matrix	3	U	Flags	(75.00%)	for	Estimated Maximum Possible Concentration
Total PeCDF			4			
Validation Flag Category: Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category: Matrix	1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration
Total TCDD			4			
Validation Flag Category: Blank	2	U	Flags	(50.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category: Matrix	2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration
Total TCDF			4			
Validation Flag Category: Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category: Matrix	3	U	Flags	(75.00%)	for	Estimated Maximum Possible Concentration

SW8330B

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8330B							
		1,3,5-Trinitrobenzene		212				
Validation Flag Category:	Blank		3	UJ	Flags	(1.42%)	for	Temperature Blank>6C
Validation Flag Category:	Blank		2	J	Flags	(0.94%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		8	J	Flags	(3.77%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Matrix		1	UJ	Flags	(0.47%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		1	UJ	Flags	(0.47%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.47%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		1	J	Flags	(0.47%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(0.47%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(0.47%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		28	UJ	Flags	(13.21%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	J	Flags	(0.47%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		3	J	Flags	(1.42%)	for	Surrogate recovery greater than upper limit
		1,3-Dinitrobenzene		210				
Validation Flag Category:	Blank		5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		5	J	Flags	(2.38%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.95%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		28	UJ	Flags	(13.33%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	UJ	Flags	(0.48%)	for	Surrogate recovery greater than upper limit
Validation Flag Category:	SurrogateRecovery		2	J	Flags	(0.95%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		2,4,6-Trinitrotoluene	211					
Validation Flag Category:		Blank	5	UJ	Flags	(2.37%)	for	Temperature Blank>6C
Validation Flag Category:		Confirmation	2	J	Flags	(0.95%)	for	Confirmation Precision Exceeded
Validation Flag Category:		Matrix	1	UJ	Flags	(0.47%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:		SurrogateRecovery	27	UJ	Flags	(12.80%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	2	J	Flags	(0.95%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	1	J	Flags	(0.47%)	for	Surrogate recovery greater than upper limit
		2,4-Dinitrotoluene	210					
Validation Flag Category:		Blank	5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:		LaboratoryControlSample	2	UJ	Flags	(0.95%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:		SurrogateRecovery	27	UJ	Flags	(12.86%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	1	J	Flags	(0.48%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	1	J	Flags	(0.48%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte							Number of Samples
WATER									
	SW8330B								
		2,6-Dinitrotoluene							210
Validation Flag Category:		Blank	5	UJ	Flags	(2.38%)	for	Temperature Blank>6C	
Validation Flag Category:		Confirmation	5	J	Flags	(2.38%)	for	Confirmation Precision Exceeded	
Validation Flag Category:		LaboratoryControlSample	2	UJ	Flags	(0.95%)	for	LCSD recovery less than the lower control limit	
Validation Flag Category:		Matrix	1	J	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit	
Validation Flag Category:		Matrix	1	J	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit	
Validation Flag Category:		Matrix	1	J	Flags	(0.48%)	for	Matrix Interference	
Validation Flag Category:		Matrix	1	UJ	Flags	(0.48%)	for	Matrix Interference	
Validation Flag Category:		SurrogateRecovery	26	UJ	Flags	(12.38%)	for	Surrogate recovery less than lower limit	
Validation Flag Category:		SurrogateRecovery	2	J	Flags	(0.95%)	for	Surrogate recovery less than lower limit	
Validation Flag Category:		SurrogateRecovery	4	J	Flags	(1.90%)	for	Surrogate recovery greater than upper limit	
		2-Amino-4,6-dinitrotoluene							210
Validation Flag Category:		Blank	5	UJ	Flags	(2.38%)	for	Temperature Blank>6C	
Validation Flag Category:		Confirmation	6	J	Flags	(2.86%)	for	Confirmation Precision Exceeded	
Validation Flag Category:		LaboratoryControlSample	2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded	
Validation Flag Category:		LaboratoryControlSample	2	UJ	Flags	(0.95%)	for	LCS recovery less than lower control limit	
Validation Flag Category:		LaboratoryControlSample	2	J	Flags	(0.95%)	for	LCSD recovery less than the lower control limit	
Validation Flag Category:		LaboratoryControlSample	2	J	Flags	(0.95%)	for	LCS recovery less than lower control limit	
Validation Flag Category:		Matrix	1	UJ	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit	
Validation Flag Category:		Matrix	1	UJ	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit	
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix Interference	
Validation Flag Category:		SurrogateRecovery	27	UJ	Flags	(12.86%)	for	Surrogate recovery less than lower limit	
Validation Flag Category:		SurrogateRecovery	2	J	Flags	(0.95%)	for	Surrogate recovery less than lower limit	
Validation Flag Category:		SurrogateRecovery	3	J	Flags	(1.43%)	for	Surrogate recovery greater than upper limit	

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		4-Amino-2,6-dinitrotoluene	209					
Validation Flag Category:	Blank		5	UJ	Flags	(2.39%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		10	J	Flags	(4.78%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.96%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample		3	UJ	Flags	(1.44%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	LaboratoryControlSample		16	UJ	Flags	(7.66%)	for	LCS recovery less than lower control limit
Validation Flag Category:	LaboratoryControlSample		3	J	Flags	(1.44%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	LaboratoryControlSample		3	J	Flags	(1.44%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		26	UJ	Flags	(12.44%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	J	Flags	(0.48%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		4	J	Flags	(1.91%)	for	Surrogate recovery greater than upper limit
		hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)	205					
Validation Flag Category:	Blank		5	UJ	Flags	(2.44%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		6	J	Flags	(2.93%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Matrix		1	UJ	Flags	(0.49%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.49%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		22	UJ	Flags	(10.73%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		5	J	Flags	(2.44%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		5	J	Flags	(2.44%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)	207					
Validation Flag Category:	Blank		5	UJ	Flags	(2.42%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		1	UJ	Flags	(0.48%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Confirmation		24	J	Flags	(11.59%)	for	Confirmation Precision Exceeded
Validation Flag Category:	FieldDuplicate		2	J	Flags	(0.97%)	for	Field duplicate exceeds RPD criteria
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		23	UJ	Flags	(11.11%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		5	J	Flags	(2.42%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		2	J	Flags	(0.97%)	for	Surrogate recovery greater than upper limit
		hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)	208					
Validation Flag Category:	Blank		5	UJ	Flags	(2.40%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		6	J	Flags	(2.88%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Matrix		2	J	Flags	(0.96%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		22	UJ	Flags	(10.58%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		6	J	Flags	(2.88%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		3	J	Flags	(1.44%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples
WATER			
	SW8330B		
		HMX	191

Validation Flag Category:	Blank	4	UJ	Flags	(2.09%)	for Temperature Blank>6C
Validation Flag Category:	Blank	1	J	Flags	(0.52%)	for Temperature Blank>6C
Validation Flag Category:	Confirmation	14	J	Flags	(7.33%)	for Confirmation Precision Exceeded
Validation Flag Category:	Matrix	1	UJ	Flags	(0.52%)	for Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix	1	UJ	Flags	(0.52%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix spike recovery greater than upper control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix spike duplicate recovery criteria greater than upper control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix Interference
Validation Flag Category:	SurrogateRecovery	20	UJ	Flags	(10.47%)	for Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	8	J	Flags	(4.19%)	for Surrogate recovery less than lower limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8330B

m-Nitrotoluene 210

Validation Flag Category:		1	UJ	Flags	(0.48%)	for	
Validation Flag Category:	Blank	5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation	3	J	Flags	(1.43%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample	2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample	13	UJ	Flags	(6.19%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	LaboratoryControlSample	15	UJ	Flags	(7.14%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix	2	UJ	Flags	(0.95%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix	3	UJ	Flags	(1.43%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix	2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:	Matrix	1	J	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	SurrogateRecovery	28	UJ	Flags	(13.33%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	1	UJ	Flags	(0.48%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		Nitrobenzene	210					
Validation Flag Category:	Blank		4	UJ	Flags	(1.90%)	for	Temperature Blank>6C
Validation Flag Category:	Blank		1	J	Flags	(0.48%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		4	J	Flags	(1.90%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample		13	UJ	Flags	(6.19%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		27	UJ	Flags	(12.86%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	J	Flags	(0.48%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		3	J	Flags	(1.43%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		o-Nitrotoluene	210					
Validation Flag Category:	Blank		5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		2	J	Flags	(0.95%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample		13	UJ	Flags	(6.19%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	LaboratoryControlSample		32	UJ	Flags	(15.24%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		3	UJ	Flags	(1.43%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	SurrogateRecovery		28	UJ	Flags	(13.33%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	UJ	Flags	(0.48%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		p-Nitrotoluene	210					
Validation Flag Category:	Blank		5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		2	J	Flags	(0.95%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample		13	UJ	Flags	(6.19%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	SurrogateRecovery		27	UJ	Flags	(12.86%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	UJ	Flags	(0.48%)	for	Surrogate recovery greater than upper limit
Validation Flag Category:	SurrogateRecovery		1	J	Flags	(0.48%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	J	Flags	(0.48%)	for	Surrogate recovery greater than upper limit
		RDX	182					
Validation Flag Category:	Blank		4	UJ	Flags	(2.20%)	for	Temperature Blank>6C
Validation Flag Category:	Blank		1	J	Flags	(0.55%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		5	J	Flags	(2.75%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Matrix		1	UJ	Flags	(0.55%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.55%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	SurrogateRecovery		21	UJ	Flags	(11.54%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		6	J	Flags	(3.30%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		2	J	Flags	(1.10%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte					Number of Samples	
WATER								
	SW8330B							
		Tetryl					212	
Validation Flag Category:	Blank		5	UJ	Flags	(2.36%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		3	J	Flags	(1.42%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Matrix		1	UJ	Flags	(0.47%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.94%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.94%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		28	UJ	Flags	(13.21%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	UJ	Flags	(0.47%)	for	Surrogate recovery greater than upper limit
Validation Flag Category:	SurrogateRecovery		2	J	Flags	(0.94%)	for	Surrogate recovery greater than upper limit

Note: The total number of validation flags may exceed the actual number of samples if multiple flags were applied to the same sample. Consequently, the percentage of total flags (flags applied/number of samples) may exceed 100 percent.

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

U = The analyte was not detected in the analysis. The associated numerical value is at or below the method detection limit (MDL).

UJ = The analyte was not detected, the quantitation is an estimate.

TABLE 4

Holding Times - Qualified Data

Method	Matrix	Sample Identification	Analyte	Holding Time	Result	Holding Time Qualifier	Criteria	Final Flag*
SW8151A	WATER	JAW30-0418						
			Pentachlorophenol	10 Days	0.0058 ug/L	UJ	HTp>UCL	UJ
SW8151A	WATER	JAW31-0418						
			Pentachlorophenol	10 Days	0.0057 ug/L	UJ	HTp>UCL	UJ
SW8151A	WATER	LINE9-FD1						
			Pentachlorophenol	10 Days	0.0061 ug/L	UJ	HTp>UCL	UJ
SW8330B	WATER	CCLTTMW004-0418						
			1,3,5-Trinitrobenzene	10 Days	0.4 ug/L	UJ	HTp>UCL	UJ
			1,3-Dinitrobenzene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			2,4,6-Trinitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			2,4-Dinitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			2,6-Dinitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			2-Amino-4,6-dinitrotoluene	10 Days	0.12 ug/L	UJ	HTp>UCL	UJ
			4-Amino-2,6-dinitrotoluene	10 Days	0.12 ug/L	UJ	HTp>UCL	UJ
			m-Nitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			o-Nitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			p-Nitrotoluene	10 Days	0.4 ug/L	UJ	HTp>UCL	UJ
SW8330B	WATER	G47-0418						
			1,3-Dinitrobenzene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			2,4,6-Trinitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			2,4-Dinitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			2,6-Dinitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			2-Amino-4,6-dinitrotoluene	13 Days	0.12 ug/L	UJ	HTp>UCL	UJ
			4-Amino-2,6-dinitrotoluene	13 Days	0.12 ug/L	UJ	HTp>UCL	UJ
			m-Nitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			Nitrobenzene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			o-Nitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			p-Nitrotoluene	13 Days	0.25 ug/L	J	HTp>UCL	J
SW8330B	WATER	GZ-2A-1118						

TABLE 4

Holding Times - Qualified Data

Method	Matrix	Sample Identification	Analyte	Holding Time	Result	Holding Time Qualifier	Criteria	Final Flag*
SW8330B	WATER	GZ-2A-1118						
			hexahydro-1,3,5-trinitroso-1,3,5-tri	41 Days	59 ug/L	J	HTp>UCL	J
			hexahydro-1,3-dinitroso-5-nitro-1,3	41 Days	21 ug/L	J	HTp>UCL	J
			hexahydro-1-nitroso-3,5-dinitro-1,3	41 Days	110 ug/L	J	HTp>UCL	J
			HMX	41 Days	600 ug/L	J	HTp>UCL	J
			RDX	41 Days	3200 ug/L	J	HTp>UCL	J
SW8330B	WATER	L3A-JAW-18-0818						
			RDX	56 Days	100 ug/L	J	HTa>UCL	J

ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

HTa>UCL = Holding time exceeded

HTp>UCL = Holding time exceeded

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): E218.6 (WATER)					
Hexavalent Chromium	L3AP-MW1-0818	0.42 UG/L	J	%R = 125 LCL=90 UCL=110	MS>UCL
	L3AP-MW1-0818	0.42 UG/L	J	MSRPD = 26.67 Limit =20	MSRPD
	L3AP-MW1-0818	0.42 UG/L	J	%R = 84 LCL=90 UCL=110	SD<LCL
	L3AP-TW19-02-3545-0419	0.23 UG/L	J	%R = 111 LCL=90 UCL=110	SD>UCL
Method (Matrix): SW6020 (WATER)					
Barium	FJAW-80-0319	0.26 mg/L	J		PDS<LCL
	JAW-58-0319	0.093 mg/L	J		PDS<LCL
	JAW-59-0319	0.16 mg/L	J		PDS<LCL
	JAW-80-0319	0.23 mg/L	J		PDS<LCL
	WPB-99-5-0319	0.96 mg/L	J		PDS<LCL
Calcium	EDA-SW04-0319	80 mg/L	J	%D=21.2 vs 10%	Dissolved>Total
Calcium, dissolved	EDA-SW04-0319	99 mg/L	J	%D=21.2 vs 10%	Dissolved>Total
Magnesium	EDA-SW04-0319	31 mg/L	J	%D=14.9 vs 10%	Dissolved>Total
Magnesium, dissolved	EDA-SW04-0319	36 mg/L	J	%D=14.9 vs 10%	Dissolved>Total
Manganese	EDA-SW04-0319	0.14 mg/L	J		PDS<LCL
Potassium	EDA-SW04-0319	8.5 mg/L	J	%D=25.6 vs 10%	Dissolved>Total
Potassium, dissolved	EDA-SW04-0319	11 mg/L	J	%D=25.6 vs 10%	Dissolved>Total
Sodium	EDA-SW04-0319	120 mg/L	J	%D=15.4 vs 10%	Dissolved>Total
Sodium, dissolved	EDA-SW04-0319	140 mg/L	J	%D=15.4 vs 10%	Dissolved>Total
Method (Matrix): SW8260B (WATER)					
1,1,1,2-Tetrachloroethane	FTP-MW4-0319	0.8 ug/L	UJ	%R = 74 LCL=78 UCL=124	SD<LCL
	JAW-80-0319	0.8 ug/L	UJ	%R = 76 LCL=78 UCL=124	SD<LCL
1,1,2-TCA	FTP-MW4-0319	0.8 ug/L	UJ	%R = 78 LCL=80 UCL=119	SD<LCL
1,1,2-Trichloro-1,2,2-trifluoroethane	JAW-80-0319	0.64 ug/L	J	MSRPD = 23.42 Limit =20	MSRPD
	JAW-80-0319	0.64 ug/L	J	%R = 76 LCL=78 UCL=123	SD<LCL
1,1-DCA	FTP-MW4-0319	0.8 ug/L	UJ	%R = 76 LCL=77 UCL=125	SD<LCL
1,1-DCE	FTP-MW4-0319	0.8 ug/L	UJ	%R = 70 LCL=71 UCL=131	SD<LCL
	JAW-80-0319	35 ug/L	J	%R = 138 LCL=71 UCL=131	MS>UCL
	JAW-80-0319	35 ug/L	J	MSRPD = 22.43 Limit =20	MSRPD
1,1-Dichloropropene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 76 LCL=79 UCL=125	SD<LCL

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8260B (WATER)					
1,1-Dichloropropene	JAW-80-0319	0.4 ug/L	UJ	MSRPD = 20.09 Limit =20	MSRPD
1,2-DCB	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=80 UCL=119	SD<LCL
1,2-Dibromoethane (EDB)	FTP-MW4-0319	0.4 ug/L	UJ	%R = 74 LCL=77 UCL=121	SD<LCL
1,3-DCB	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=80 UCL=119	SD<LCL
1,3-Dichloropropane	FTP-MW4-0319	0.2 ug/L	UJ	%R = 75 LCL=80 UCL=119	SD<LCL
1,4-DCB	FTP-MW4-0319	0.4 ug/L	UJ	%R = 72 LCL=79 UCL=118	SD<LCL
2-Chlorotoluene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 75 LCL=79 UCL=122	SD<LCL
4-Chlorotoluene	FTP-MW4-0319	0.8 ug/L	UJ	%R = 72 LCL=78 UCL=122	SD<LCL
Benzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 76 LCL=79 UCL=120	SD<LCL
Bromobenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 72 LCL=80 UCL=120	SD<LCL
Bromochloromethane	FTP-MW4-0319	0.2 ug/L	UJ	%R = 76 LCL=78 UCL=123	SD<LCL
Bromodichloromethane	FTP-MW4-0319	0.4 ug/L	UJ	%R = 78 LCL=79 UCL=125	SD<LCL
Bromoform	FTP-MW4-0319	1 ug/L	UJ	%R = 60 LCL=66 UCL=130	SD<LCL
Carbon disulfide	FTP-MW4-0319	0.8 ug/L	UJ	%R = 63 LCL=64 UCL=133	SD<LCL
	JAW-80-0319	0.8 ug/L	UJ	MSRPD = 22.92 Limit =20	MSRPD
	L3AP-MW1-0818	1.6 ug/L	UJ	%R = 58 LCL=64 UCL=133	MS<LCL
	L3AP-MW1-0818	1.6 ug/L	UJ	%R = 58 LCL=64 UCL=133	SD<LCL
Carbon tetrachloride	JAW-80-0319	0.4 ug/L	UJ	%R = 69 LCL=72 UCL=136	SD<LCL
Chlorobenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 75 LCL=82 UCL=118	SD<LCL
Chloroethane	JAW-80-0319	1.6 ug/L	UJ	MSRPD = 20.53 Limit =20	MSRPD
Chloroform	FTP-MW4-0319	0.4 ug/L	UJ	%R = 77 LCL=79 UCL=124	SD<LCL
Cis-1,2-DCE	FTP-MW4-0319	0.4 ug/L	UJ	%R = 76 LCL=78 UCL=123	SD<LCL
cis-1,3-Dichloropropene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 69 LCL=75 UCL=124	SD<LCL
Dibromochloromethane	FTP-MW4-0319	0.4 ug/L	UJ	%R = 64 LCL=74 UCL=126	SD<LCL
Dibromomethane	FTP-MW4-0319	0.4 ug/L	UJ	%R = 76 LCL=79 UCL=123	SD<LCL
Dichlorodifluoromethane	JAW-80-0319	0.8 ug/L	UJ	MSRPD = 22.75 Limit =20	MSRPD
Ethylbenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 74 LCL=79 UCL=121	SD<LCL
m,p-Xylene	FTP-MW4-0319	0.8 ug/L	UJ	%R = 74 LCL=80 UCL=121	SD<LCL

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8260B (WATER)					
n-Butylbenzene	FTP-MW4-0319	0.8 ug/L	UJ	%R = 73 LCL=75 UCL=128	SD<LCL
n-Propylbenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=76 UCL=126	SD<LCL
o-Xylene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 75 LCL=78 UCL=122	SD<LCL
p-Isopropyltoluene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 74 LCL=77 UCL=127	SD<LCL
sec-Butylbenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 72 LCL=77 UCL=126	SD<LCL
	JAW-80-0319	0.4 ug/L	UJ	MSRPD = 20.19 Limit =20	MSRPD
	JAW-80-0319	0.4 ug/L	UJ	%R = 75 LCL=77 UCL=126	SD<LCL
TCE	FTP-MW4-0319	0.4 ug/L	UJ	%R = 74 LCL=79 UCL=123	SD<LCL
tert-Butylbenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=78 UCL=124	SD<LCL
Toluene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 78 LCL=80 UCL=121	SD<LCL
trans-1,2-DCE	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=75 UCL=124	SD<LCL
Trichlorofluoromethane	JAW-80-0319	0.8 ug/L	UJ	MSRPD = 22.52 Limit =20	MSRPD
Method (Matrix): SW8290 (WATER)					
1,2,3,4,6,7,8-Heptachlorodibenzofuran	JAW29-0418	0.72 pg/L	U		EMPC
	L9MW1-0418	0.46 pg/L	U		EMPC
	L9TTMW02-0418	1.8 pg/L	U		EMPC
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxi	JAW31-0418	1.1 pg/L	U		EMPC
	L9MW1-0418	0.85 pg/L	U		EMPC
1,2,3,4,7,8-Hexachlorodibenzofuran	JAW29-0418	0.28 pg/L	U		EMPC
	L9TTMW02-0418	1.6 pg/L	U		EMPC
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	L9TTMW02-0418	1.6 pg/L	U		EMPC
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	JAW29-0418	0.47 pg/L	U		EMPC
1,2,3,7,8,9-Hexachlorodibenzofuran	JAW31-0418	0.46 pg/L	U		EMPC
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	L9TTMW02-0418	0.47 pg/L	U		EMPC
2,3,7,8-Tetrachlorodibenzofuran	L9TTMW02-0418	2.2 pg/L	U		EMPC
2,3,7,8-Tetrachlorodibenzo-p-dioxin	JAW29-0418	2.3 pg/L	U		EMPC
	L9MW1-0418	2.3 pg/L	U		EMPC
Total HpCDD	JAW31-0418	2.3 pg/L	U		EMPC
	L9MW1-0418	2 pg/L	U		EMPC

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8290 (WATER)					
Total HpCDF	JAW29-0418	0.72 pg/L	U		EMPC
	L9MW1-0418	0.46 pg/L	U		EMPC
	L9TTMW02-0418	13 pg/L	U		EMPC
Total HxCDD	JAW29-0418	2.9 pg/L	U		EMPC
	L9TTMW02-0418	4.7 pg/L	U		EMPC
Total HxCDF	JAW29-0418	2.3 pg/L	U		EMPC
	JAW31-0418	0.46 pg/L	U		EMPC
	L9TTMW02-0418	20 pg/L	U		EMPC
Total PeCDF	L9TTMW02-0418	5.8 pg/L	U		EMPC
Total TCDD	JAW29-0418	2.3 pg/L	U		EMPC
	L9MW1-0418	2.3 pg/L	U		EMPC
Total TCDF	JAW31-0418	1.4 pg/L	U		EMPC
	L9MW1-0418	1 pg/L	U		EMPC
	L9TTMW02-0418	4.6 pg/L	U		EMPC
Method (Matrix): SW8330B (WATER)					
1,3,5-Trinitrobenzene	G-40-0518	0.05 ug/L	J	MSRPD = 31.17 Limit =20	MSRPD
	L3AP-MW1-0818	0.15 ug/L	J	%R = 66 LCL=73 UCL=125	MS<LCL
	L3AP-MW1-0818	0.15 ug/L	J	%R = 60 LCL=73 UCL=125	SD<LCL
	L800-G-58-0818	0.11 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-TTMW18-0818	0.1 ug/L	UJ	MSRPD = 20.44 Limit =20	MSRPD
1,3-Dinitrobenzene	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
2,4,6-Trinitrotoluene	5B-MW3-0718	0.099 ug/L	UJ	%R = 61 LCL=71 UCL=123	MS<LCL
	5B-MW3-0718	0.099 ug/L	UJ	%R = 65 LCL=71 UCL=123	SD<LCL
	L3AP-MW1-0818	0.1 ug/L	UJ	%R = 65 LCL=71 UCL=123	SD<LCL
	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
2,4-Dinitrotoluene	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
2,6-Dinitrotoluene	L3AP-MW1-0818	0.58 ug/L	J	%R = 39 LCL=77 UCL=127	MS<LCL
	L3AP-MW1-0818	0.58 ug/L	J	%R = 51 LCL=77 UCL=127	SD<LCL

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
2,6-Dinitrotoluene	L800-G-58-0818	0.058 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
2-Amino-4,6-dinitrotoluene	5B-MW3-0718	0.099 ug/L	UJ	%R = 76 LCL=79 UCL=120	MS<LCL
	5B-MW3-0718	0.099 ug/L	UJ	%R = 76 LCL=79 UCL=120	SD<LCL
	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
4-Amino-2,6-dinitrotoluene	JAW-52-1118	0.1 ug/L	UJ	%R = 65 LCL=76 UCL=125	MS<LCL
	JAW-52-1118	0.1 ug/L	UJ	MSRPD = 22.85 Limit =20	MSRPD
	L800-G-58-0818	0.33 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
hexahydro-1,3,5-trinitroso-1,3,5-triazine	L800-G-58-0818	0.28 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
hexahydro-1,3-dinitroso-5-nitro-1,3,5-tria	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.17 ug/L	J	narrative, possible false pos or neg	Matrix Interference
hexahydro-1-nitroso-3,5-dinitro-1,3,5-tria	L800-G-58-0818	6 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.82 ug/L	J	narrative, possible false pos or neg	Matrix Interference
HMX	5B-MW3-0718	0.099 ug/L	UJ	%R = 31 LCL=65 UCL=135	MS<LCL
	5B-MW3-0718	0.099 ug/L	UJ	%R = 30 LCL=65 UCL=135	SD<LCL
	EDA-2-0319	6 ug/L	J	%R = 170 LCL=65 UCL=135	MS>UCL
	EDA-2-0319	6 ug/L	J	%R = 164 LCL=65 UCL=135	SD>UCL
	L3AP-MW1-0818	1.3 ug/L	J	%R = -2 LCL=65 UCL=135	MS<LCL
	L3AP-MW1-0818	1.3 ug/L	J	%R = -5 LCL=65 UCL=135	SD<LCL
	L800-G-58-0818	57 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.12 ug/L	J	narrative, possible false pos or neg	Matrix Interference
m-Nitrotoluene	FTP-MW4-0319	0.39 ug/L	UJ	%R = 52 LCL=73 UCL=125	MS<LCL
	FTP-MW4-0319	0.39 ug/L	UJ	%R = 56 LCL=73 UCL=125	SD<LCL
	JAW-11-0319	0.4 ug/L	UJ	%R = 70 LCL=73 UCL=125	SD<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 51 LCL=73 UCL=125	MS<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 55 LCL=73 UCL=125	SD<LCL
	L3AP-MW1-0818	0.52 ug/L	J	%R = 57 LCL=73 UCL=125	MS<LCL
	L3AP-MW1-0818	0.52 ug/L	J	%R = 68 LCL=73 UCL=125	SD<LCL
	L800-G-58-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
Nitrobenzene	FTP-MW4-0319	0.19 ug/L	UJ	%R = 52 LCL=65 UCL=134	MS<LCL
	FTP-MW4-0319	0.19 ug/L	UJ	%R = 62 LCL=65 UCL=134	SD<LCL
	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
o-Nitrotoluene	FTP-MW4-0319	0.19 ug/L	UJ	%R = 39 LCL=70 UCL=127	MS<LCL
	FTP-MW4-0319	0.19 ug/L	UJ	%R = 47 LCL=70 UCL=127	SD<LCL
	JAW-11-0319	0.2 ug/L	UJ	%R = 66 LCL=70 UCL=127	SD<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 46 LCL=70 UCL=127	MS<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 49 LCL=70 UCL=127	SD<LCL
	L3AP-MW1-0818	0.32 ug/L	J	%R = 69 LCL=70 UCL=127	MS<LCL
	L3AP-MW1-0818	0.32 ug/L	J	%R = 67 LCL=70 UCL=127	SD<LCL
	L800-G-58-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
p-Nitrotoluene	FTP-MW4-0319	0.39 ug/L	UJ	%R = 62 LCL=71 UCL=127	MS<LCL
	FTP-MW4-0319	0.39 ug/L	UJ	%R = 65 LCL=71 UCL=127	SD<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 60 LCL=71 UCL=127	MS<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 64 LCL=71 UCL=127	SD<LCL
	L3AP-MW1-0818	0.46 ug/L	J	%R = 54 LCL=71 UCL=127	MS<LCL
	L3AP-MW1-0818	0.46 ug/L	J	%R = 64 LCL=71 UCL=127	SD<LCL
	L800-G-58-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
RDX	L800-G-58-0818	410 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-TTMW18-0818	1.3 ug/L	J	%R = 40 LCL=68 UCL=130	MS<LCL
Tetryl	5B-MW3-0718	0.099 ug/L	UJ	%R = 52 LCL=64 UCL=128	MS<LCL
	5B-MW3-0718	0.099 ug/L	UJ	%R = 52 LCL=64 UCL=128	SD<LCL
	L3AP-MW1-0818	0.1 ug/L	UJ	%R = 56 LCL=64 UCL=128	SD<LCL
	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

%D = percent difference
%R = percent recovery
LCL = lower control limit
UCL = upper control limit

mg/L = milligrams per liter
pg/L = Undefined Unit in tlkpUnits
UG/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.
U = The analyte was not detected in the analysis. The associated numerical value is at or below the method detection limit (MDL).
UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

Dissolved>Total	=	Dissolved metal result greater than the total metal result
EMPC	=	Estimated Maximum Possible Concentration
Matrix Interference	=	Matrix Interference
MS<LCL	=	Matrix spike recovery less than lower control limit
MS>UCL	=	Matrix spike recovery greater than upper control limit
MSRPD	=	Matrix spike RPD criteria exceedance
PDS	=	Post digestion spike failed
PDS<LCL	=	Post-Digestion Spike recovery less than the lower control limit
SD<LCL	=	Matrix spike duplicate recovery criteria less than lower control limit
SD>UCL	=	Matrix spike duplicate recovery criteria greater than upper control limit

TABLE 6

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8082	SOIL		**Aroclor-1016**				
		CDL-SD8-0319		0.055 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1221**				
		CDL-SD8-0319		0.14 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1232**				
		CDL-SD8-0319		0.055 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1242**				
		CDL-SD8-0319		0.085 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1248**				
		CDL-SD8-0319		0.027 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1254**				
		CDL-SD8-0319		0.059 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1260**				
		CDL-SD8-0319		0.012 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8330B	WATER		**1,3,5-Trinitrobenzene**				
		5A-MW2-0718		0.069 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		0.19 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**1,3,5-Trinitrobenzene**				
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.41 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		59 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		0.11 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		1.3 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**1,3-Dinitrobenzene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**1,3-Dinitrobenzene**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		0.2 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		0.54 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		2.5 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
		WBP-TTMW-F11-0319		2.8 ug/L	J	%R = 498 LCL=83 UCL=119	Sur>UCL
SW8330B	WATER		**2,4,6-Trinitrotoluene**				
		5A-MW2-0718		0.68 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.26 ug/L	J	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**2,4,6-Trinitrotoluene**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.41 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		12 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		9.7 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**2,4-Dinitrotoluene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**2,4-Dinitrotoluene**				
		L800-G20-0818		4.5 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		3.2 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**2,6-Dinitrotoluene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.086 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		2.8 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		0.058 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**2,6-Dinitrotoluene**				
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		4.3 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.34 ug/L	J	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		1 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
		WBP-TTMW-F11-0319		0.82 ug/L	J	%R = 498 LCL=83 UCL=119	Sur>UCL
SW8330B	WATER		**2-Amino-4,6-dinitrotoluene**				
		5A-MW2-0718		6.9 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		2.9 ug/L	J	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		7.4 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.12 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		16 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**2-Amino-4,6-dinitrotoluene**				
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW27-0818		11 ug/L	J	%R=119 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		18 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		SA-99-1-0319		1.2 ug/L	J	%R=336 LCL=83 UCL=119	Sur>UCL
		WBP-99-6-0319		0.12 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.12 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**4-Amino-2,6-dinitrotoluene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		5.4 ug/L	J	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		7.3 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.12 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		7.9 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**4-Amino-2,6-dinitrotoluene**				
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		0.33 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL
		L800-MW27-0818		21 ug/L	J	%R=119 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		30 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		SA-99-1-0319		4.4 ug/L	J	%R=336 LCL=83 UCL=119	Sur>UCL
		WBP-MW1-0319		0.12 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)**				
		5A-MW2-0718		0.077 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		59 ug/L	J	%R = 3730 LCL = 79 UCL = 111	Sur>UCL
		GZ-3-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.2 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		1.7 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.24 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.2 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.2 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.23 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.2 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.2 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.14 ug/L	J	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.26 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)**				
		L3A-TW19-04B-5060-0419		0.1 ug/L	J	%R=169 LCL=83 UCL=119	Sur>UCL
		L800-G20-0818		48 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur<LCL
		L800-G-43-0818		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		0.28 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL
		L800-MW25-0818		25 ug/L	J	%R=112 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.2 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		110 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.27 ug/L	J	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		1.6 ug/L	J	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		20 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
		WBP-TTMW-F11-0319		23 ug/L	J	%R = 498 LCL=83 UCL=119	Sur>UCL
SW8330B	WATER		**hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)**				
		5A-MW2-0718		0.89 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		21 ug/L	J	%R = 3730 LCL = 79 UCL = 111	Sur>UCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		16 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		JAW-71-0818		2.1 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.88 ug/L	J	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.26 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		18 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.17 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		36 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.3 ug/L	J	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.25 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		23 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
SW8330B	WATER		**hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)**				
		5A-MW2-0718		1.2 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.41 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		110 ug/L	J	%R = 3730 LCL = 79 UCL = 111	Sur>UCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		3.3 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.31 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.098 ug/L	J	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		1 ug/L	J	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.3 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		19 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		6 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.82 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		43 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.29 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.28 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**HMX**				
		5A-MW2-0718		6.6 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		600 ug/L	J	%R=3872 LCL=79 UCL=111	Sur>UCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		160 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		JAW-71-0818		4.9 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.053 ug/L	J	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.16 ug/L	J	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.6 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**HMX**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		6.4 ug/L	J	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		620 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		57 ug/L	J	%R=129 LCL=79 UCL=111	Sur>UCL
		L800-MW25-0818		13 ug/L	J	%R=112 LCL=79 UCL=111	Sur>UCL
		L800-MW27-0818		32 ug/L	J	%R=119 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.12 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		190 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.084 ug/L	J	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**m-Nitrotoluene**				
		5B-DP2-0618		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.2 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.2 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.2 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.2 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.23 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.2 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.2 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**m-Nitrotoluene**				
		L2-MW9-0818		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.21 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.41 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		7.8 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.2 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		1.1 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.21 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**Nitrobenzene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		14 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**Nitrobenzene**				
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L3AP-TW19-02-3545-0419		0.23 ug/L	J	%R=127 LCL=83 UCL=119	Sur>UCL
		L3A-TW19-02-1020-0419		0.14 ug/L	J	%R=120 LCL=83 UCL=119	Sur>UCL
		L800-G20-0818		0.2 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		3.4 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.43 ug/L	J	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**o-Nitrotoluene**				
		5B-DP2-0618		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.2 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.2 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.2 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.2 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.23 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.2 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.2 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.21 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**o-Nitrotoluene**				
		L800-G20-0818		0.41 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.2 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		1.1 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.21 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**p-Nitrotoluene**				
		5B-DP2-0618		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.2 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.2 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.2 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.2 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.23 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.2 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.2 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.21 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.39 ug/L	J	%R=77 LCL=83 UCL=119	Sur<LCL
		L3A-TW19-04B-5060-0419		0.27 ug/L	J	%R=169 LCL=83 UCL=119	Sur>UCL
		L800-G20-0818		0.41 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**p-Nitrotoluene**				
		L800-MW28-0818		0.2 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		1.1 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.21 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**RDX**				
		5A-MW2-0718		6.5 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		3200 ug/L	J	%R=4111 LCL=79 UCL=111	Sur>UCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		180 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		JAW-71-0818		2.4 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.096 ug/L	J	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		1.1 ug/L	J	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		100 ug/L	J	%R=502 LCL=79 UCL=111	Sur>UCL
		L3A-MW5A-0818		2.6 ug/L	J	%R=121 LCL=79 UCL=111	Sur>UCL
		L3AP-TW19-01-3545-0419		0.41 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		6500 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**RDX**				
		L800-G-58-0818		410 ug/L	J	%R=134 LCL=79 UCL=111	Sur>UCL
		L800-MW25-0818		180 ug/L	J	%R=112 LCL=79 UCL=111	Sur>UCL
		L800-MW27-0818		300 ug/L	J	%R=161 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		630 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		1.3 ug/L	J	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.086 ug/L	J	%R=71 LCL=79 UCL=111	Sur<LCL
		SA-99-1-0319		5.1 ug/L	J	%R=336 LCL=83 UCL=119	Sur>UCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**Tetryl**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		0.2 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**Tetryl**				
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		0.54 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		1.7 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
		WBP-TTMW-F11-0319		1.2 ug/L	J	%R = 498 LCL=83 UCL=119	Sur>UCL

%R = percent recovery
LCL = lower control limit
UCL = upper control limit

mg/Kg = milligrams per kilogram
ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:
J = The analyte was positively identified, the quantitation is an estimate.
UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:
Sur<LCL = Surrogate recovery less than lower limit
Sur>UCL = Surrogate recovery greater than upper limit

TABLE 7

Internal Standards - Qualified Data

Sample Identification	Analyte	Result	Internal Standard Qualifier*	Criteria
Method (Matrix): SW8260B (WATER)				
FTP-MW6-R0319				
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.21 ug/L	J	IS<LCL
JAW-60-0319				
	1,1,1-TCA	12 ug/L	J	IS<LCL
	1,1,2-TCA	2.5 ug/L	J	IS<LCL
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.56 ug/L	J	IS<LCL
	1,1-DCA	140 ug/L	J	IS<LCL
	1,2-DCA	30 ug/L	J	IS<LCL
	Benzene	0.87 ug/L	J	IS<LCL
	Chloroethane	5.8 ug/L	J	IS<LCL
	Chloroform	1.8 ug/L	J	IS<LCL
	Cis-1,2-DCE	190 ug/L	J	IS<LCL
	TCE	37 ug/L	J	IS<LCL
	Tetrachloroethene	1.9 ug/L	J	IS<LCL
	trans-1,2-DCE	0.58 ug/L	J	IS<LCL
	Vinyl chloride	1.3 ug/L	J	IS<LCL
WBP-99-5-R0319				
	1,1,2-Trichloro-1,2,2-trifluoroethane	37000 ug/L	J	IS<LCL
	1,1-DCA	0.58 ug/L	J	IS<LCL
	1,2,4-Trimethylbenzene	2.7 ug/L	J	IS<LCL
	1,3,5-Trimethylbenzene	0.64 ug/L	J	IS<LCL
	Benzene	0.17 ug/L	J	IS<LCL
	Cis-1,2-DCE	0.87 ug/L	J	IS<LCL
	Ethylbenzene	0.7 ug/L	J	IS<LCL
	Isopropylbenzene	0.22 ug/L	J	IS<LCL
	m,p-Xylene	2.1 ug/L	J	IS<LCL
	MEK (2-Butanone)	8.1 ug/L	J	IS<LCL
	Naphthalene	3.2 ug/L	J	IS<LCL
	n-Butylbenzene	0.67 ug/L	J	IS<LCL
	n-Propylbenzene	0.28 ug/L	J	IS<LCL
	o-Xylene	1.7 ug/L	J	IS<LCL
	p-Isopropyltoluene	0.58 ug/L	J	IS<LCL
	sec-Butylbenzene	0.52 ug/L	J	IS<LCL
	TCE	0.77 ug/L	J	IS<LCL
	Toluene	6 ug/L	J	IS<LCL

TABLE 7

Internal Standards - Qualified Data

Sample Identification	Analyte	Result	Internal Standard Qualifier*	Criteria
Method (Matrix): SW8260B (WATER)				
WBP-99-6-0319				
	1,2,4-Trimethylbenzene	3.9 ug/L	J	IS<LCL
	1,3,5-Trimethylbenzene	1.3 ug/L	J	IS<LCL
	Benzene	0.47 ug/L	J	IS<LCL
	Bromomethane	1.3 ug/L	J	IS<LCL
	Carbon disulfide	68 ug/L	J	IS<LCL
	Ethylbenzene	1.9 ug/L	J	IS<LCL
	Isopropylbenzene	0.36 ug/L	J	IS<LCL
	m,p-Xylene	2.9 ug/L	J	IS<LCL
	Naphthalene	1.6 ug/L	J	IS<LCL
	n-Butylbenzene	0.93 ug/L	J	IS<LCL
	n-Propylbenzene	0.61 ug/L	J	IS<LCL
	o-Xylene	2.8 ug/L	J	IS<LCL
	p-Isopropyltoluene	0.7 ug/L	J	IS<LCL
	sec-Butylbenzene	0.69 ug/L	J	IS<LCL
	TCE	0.26 ug/L	J	IS<LCL
	Toluene	8.1 ug/L	J	IS<LCL
WBP-MW8-0319				
	1,1,2-Trichloro-1,2,2-trifluoroethane	8800 ug/L	J	IS<LCL
WBP-MW9-0319				
	1,2,4-Trimethylbenzene	1.9 ug/L	J	IS<LCL
	1,3,5-Trimethylbenzene	0.58 ug/L	J	IS<LCL
	1-Chlorohexane	0.31 ug/L	J	IS<LCL
	Chloroform	2.1 ug/L	J	IS<LCL
	Ethylbenzene	0.43 ug/L	J	IS<LCL
	m,p-Xylene	1.1 ug/L	J	IS<LCL
	Naphthalene	1.3 ug/L	J	IS<LCL
	n-Butylbenzene	0.8 ug/L	J	IS<LCL
	n-Propylbenzene	0.23 ug/L	J	IS<LCL
	o-Xylene	0.62 ug/L	J	IS<LCL
	p-Isopropyltoluene	0.56 ug/L	J	IS<LCL
	sec-Butylbenzene	0.49 ug/L	J	IS<LCL
	Toluene	1.2 ug/L	J	IS<LCL
WBP-TTMW-10-0319				

TABLE 7

Internal Standards - Qualified Data

Sample Identification	Analyte	Result	Internal Standard Qualifier*	Criteria
Method (Matrix): SW8260B (WATER)				
	1,1,2-Trichloro-1,2,2-trifluoroethane	540 ug/L	J	IS<LCL
WBP-TTMW-11-0319				
	1,1,1-TCA	0.61 ug/L	J	IS<LCL
	1,1-DCA	3.5 ug/L	J	IS<LCL
	Benzene	0.18 ug/L	J	IS<LCL
	Bromomethane	5.6 ug/L	J	IS<LCL
	Chloroform	0.51 ug/L	J	IS<LCL
	Chloromethane	4 ug/L	J	IS<LCL
	Cis-1,2-DCE	57 ug/L	J	IS<LCL
	TCE	54 ug/L	J	IS<LCL
	trans-1,2-DCE	0.5 ug/L	J	IS<LCL

ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

Criteria:

IS<LCL = Internal standard response less than lower control limit

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**1,3,5-Trinitrobenzene**			
		5A-MW2-0718		0.069 ug/L	J	CF>RPD
		JAW70-0818		0.19 ug/L	J	CF>RPD
		L3A-MW3B-0818		0.036 ug/L	J	CF>RPD
		L3AP-MW1-0818		0.15 ug/L	J	CF>RPD
		L3-DP1-2530-0718		0.2 ug/L	J	CF>RPD
		L3-DP2-1520-0718		0.035 ug/L	J	CF>RPD
		L800-MW14-0818		0.053 ug/L	J	CF>RPD
		L800-MW31-0818		0.19 ug/L	J	CF>RPD
SW8330B	WATER		**1,3-Dinitrobenzene**			
		CW-P-0618		0.056 ug/L	J	CF>RPD
		L3AP-MW1-0818		0.11 ug/L	J	CF>RPD
		L800-MW31-0818		7.6 ug/L	J	CF>RPD
		WBP-TTMW-11-0319		2.5 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		2.8 ug/L	J	CF>RPD
SW8330B	WATER		**2,4,6-Trinitrotoluene**			
		L2-JAW-75-0818		0.26 ug/L	J	CF>RPD
		L800-G20-0818		12 ug/L	J	CF>RPD
		L800-MW31-0818		7.6 ug/L	J	CF>RPD
SW8330B	WATER		**2,4-Dinitrotoluene**			
		L800-G20-0818		4.5 ug/L	J	CF>RPD
SW8330B	WATER		**2,6-Dinitrotoluene**			
		L3AP-MW1-0818		0.58 ug/L	J	CF>RPD
		L800-G20-0818		2.8 ug/L	J	CF>RPD
		L800-MW27-0818		0.88 ug/L	J	CF>RPD
		WBP-99-6-0319		0.34 ug/L	J	CF>RPD
		WBP-TTMW-11-0319		1 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		0.82 ug/L	J	CF>RPD
SW8330B	WATER		**2-Amino-4,6-dinitrotoluene**			
		L800-MW31-0818		2.2 ug/L	J	CF>RPD

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**2-Amino-4,6-dinitrotoluene**			
		WBP-99-2-0319		0.074 ug/L	J	CF>RPD
		WBP-TTMW-02-0319		0.51 ug/L	J	CF>RPD
		WBP-TTMW-06-0319		0.068 ug/L	J	CF>RPD
		WBP-TTMW-12-0319		0.43 ug/L	J	CF>RPD
		WBP-TTMW-14-0319		0.42 ug/L	J	CF>RPD
SW8330B	WATER		**4-Amino-2,6-dinitrotoluene**			
		JAW-23-0319		0.12 ug/L	J	CF>RPD
		JAW-25-0319		0.11 ug/L	J	CF>RPD
		JAW-25-0319		0.11 ug/L	J	CF>RPD
		PDS-MW3-0818		0.11 ug/L	J	CF>RPD
		SA-99-1-0319		4.4 ug/L	J	CF>RPD
		WBP-99-2-0319		0.23 ug/L	J	CF>RPD
		WBP-TTMW-02-0319		1.1 ug/L	J	CF>RPD
		WBP-TTMW-03-0319		0.26 ug/L	J	CF>RPD
		WBP-TTMW-12-0319		0.41 ug/L	J	CF>RPD
		WBP-TTMW-15-0319		0.51 ug/L	J	CF>RPD
SW8330B	WATER		**hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)**			
		5A-MW2-0718		0.077 ug/L	J	CF>RPD
		CCL-TTMW003-0818		0.06 ug/L	J	CF>RPD
		GZ-2A-1118		59 ug/L	J	CF>RPD
		L800-MW31-0818		0.49 ug/L	J	CF>RPD
		L800-TTMW18-0818		0.27 ug/L	J	CF>RPD
		WBP-99-2-0319		0.16 ug/L	J	CF>RPD
		WBP-99-6-0319		1.6 ug/L	J	CF>RPD
SW8330B	WATER		**hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)**			
		5A-MW2-0718		0.89 ug/L	J	CF>RPD
		CTATW003-0618		0.47 ug/L	J	CF>RPD
		JAW-17-0818		0.74 ug/L	J	CF>RPD
		JAW-23-0319		0.76 ug/L	J	CF>RPD

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)**			
		JAW-24-0319		0.18 ug/L	J	CF>RPD
		JAW70-0818		16 ug/L	J	CF>RPD
		JAW-71-0818		2.1 ug/L	J	CF>RPD
		L1-MW103-0319		0.84 ug/L	J	CF>RPD
		L3A-JAW-18-0818		0.88 ug/L	J	CF>RPD
		L3A-MW4A-0818		0.058 ug/L	J	CF>RPD
		L3AP-MW1-0818		0.08 ug/L	J	CF>RPD
		L3AP-MW3-0818		0.17 ug/L	J	CF>RPD
		L3AP-MW4-0818		0.068 ug/L	J	CF>RPD
		L800-MW1-0818		0.083 ug/L	J	CF>RPD
		L800-MW14-0818		0.1 ug/L	J	CF>RPD
		L800-MW27-0818		3.6 ug/L	J	CF>RPD
		L800-MW31-0818		0.11 ug/L	UJ	CF>RPD
		WBP-99-6-0319		0.3 ug/L	J	CF>RPD
		WBP-TTMW-02-0319		4.7 ug/L	J	CF>RPD
		WBP-TTMW-03-0319		0.43 ug/L	J	CF>RPD
		WBP-TTMW-06-0319		0.33 ug/L	J	CF>RPD
		WBP-TTMW-11-0319		23 ug/L	J	CF>RPD
		WBP-TTMW-12-0319		0.39 ug/L	J	CF>RPD
		WBP-TTMW-14-0319		0.33 ug/L	J	CF>RPD
		WBP-TTMW-15-0319		0.14 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		36 ug/L	J	CF>RPD
SW8330B	WATER		**hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)**			
		5B-DP2-0618		0.41 ug/L	J	CF>RPD
		JAW-25-0319		0.74 ug/L	J	CF>RPD
		NBP-MW1-0319		0.1 ug/L	J	CF>RPD
		WBP-99-1-0319		0.24 ug/L	J	CF>RPD
		WBP-TTMW-11-0319		30 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		33 ug/L	J	CF>RPD

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**HMX**			
		CCL-TTMW001-0818		8.4 ug/L	J	CF>RPD
		FTA-TT-MW-05-0319		0.43 ug/L	J	CF>RPD
		FTA-TT-MW-F05-0319		0.45 ug/L	J	CF>RPD
		JAW-11-0319		0.088 ug/L	J	CF>RPD
		JAW-20-0818		0.038 ug/L	J	CF>RPD
		JAW-59-0319		0.24 ug/L	J	CF>RPD
		L3AP-MW1-0818		1.3 ug/L	J	CF>RPD
		L3-DP1-2530-0718		0.2 ug/L	J	CF>RPD
		L800-MW14-0818		0.17 ug/L	J	CF>RPD
		L800-MW28-0818		0.12 ug/L	J	CF>RPD
		L800-MW31-0818		1.3 ug/L	J	CF>RPD
		WBP-99-1-0319		0.86 ug/L	J	CF>RPD
		WBP-99-4-0319		13 ug/L	J	CF>RPD
		WBP-TTMW-04-0319		0.55 ug/L	J	CF>RPD
SW8330B	WATER		**m-Nitrotoluene**			
		L3AP-MW1-0818		0.52 ug/L	J	CF>RPD
		L3AP-MW3-0818		0.18 ug/L	J	CF>RPD
		L800-G20-0818		7.8 ug/L	J	CF>RPD
		L800-MW27-0818		1.4 ug/L	J	CF>RPD
SW8330B	WATER		**Nitrobenzene**			
		JAW70-0818		14 ug/L	J	CF>RPD
		L3AP-TW19-02-3545-0419		0.23 ug/L	J	CF>RPD
		L3AP-TW19-03-3545-0419		0.21 ug/L	J	CF>RPD
		L3A-TW19-02-1020-0419		0.14 ug/L	J	CF>RPD
		L800-TTMW18-0818		0.43 ug/L	J	CF>RPD
SW8330B	WATER		**o-Nitrotoluene**			
		L3AP-MW1-0818		0.32 ug/L	J	CF>RPD
		L3AP-MW3-0818		0.46 ug/L	J	CF>RPD
SW8330B	WATER		**p-Nitrotoluene**			

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**p-Nitrotoluene**			
		L3AP-MW1-0818		0.46 ug/L	J	CF>RPD
		L3A-TW19-04B-5060-0419		0.27 ug/L	J	CF>RPD
SW8330B	WATER		**RDX**			
		FTA-99-1-0319		0.36 ug/L	J	CF>RPD
		L1-MW102-1118		0.096 ug/L	J	CF>RPD
		L3A-MW5B-0818		0.13 ug/L	J	CF>RPD
		L3AP-MW1-0818		0.076 ug/L	J	CF>RPD
		LI-MW107-1118		0.086 ug/L	J	CF>RPD
SW8330B	WATER		**Tetryl**			
		CCL-TTMW002-0818		0.35 ug/L	J	CF>RPD
		L3A-MW6A-0818		0.16 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		1.2 ug/L	J	CF>RPD

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

CF>RPD = Confirmation Precision Exceeded

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
1,1,1,2-Tetrachloroethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,1,1-TCA					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	7.5 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	23 ug/L	J	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.5 ug/L	J	SI	
	JAW-60-0319	12 ug/L	J	SI	
	JAW-80-0319	6.6 ug/L	J	SI	

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.43 ug/L	J	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.61 ug/L	J	SI	
	WBP-TTMW-F11-0319	0.65 ug/L	J	SI	
1,1,2,2-Tetrachloroethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,1,2-TCA					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	J	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	2.5 ug/L	J	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,1,2-Trichloro-1,2,2-trifluoroethane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	FTP-MW6-R0319	0.21 ug/L	U	TB<RL	blank target = 3.55 ug/L
	G-30-R0319	0.4 ug/L	U	TB<RL	blank target = 3.55 ug/L
	JAW-23-0319	6.1 ug/L	J	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.56 ug/L	J	SI	
	JAW-80-0319	0.64 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	4 ug/L	J	SI	
	WBP-MW1-0319	0.4 ug/L	U	TB<RL	blank target = 3.55 ug/L
	WBP-MW2-0319	0.84 ug/L	J	SI	
	WBP-TTMW-05B-0319	0.4 ug/L	U	TB<RL	blank target = 3.55 ug/L
1,1-DCA					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	6.5 ug/L	J	SI	
	FTA-TT-MW-01-0319	3.1 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.71 ug/L	J	SI	
	FTA-TT-MW-F05-0319	0.68 ug/L	J	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.72 ug/L	J	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	140 ug/L	J	SI	
	JAW-80-0319	6 ug/L	J	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.58 ug/L	J	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	1 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	3.5 ug/L	J	SI	
	WBP-TTMW-F11-0319	3.3 ug/L	J	SI	
1,1-DCE					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	39 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	55 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	1.4 ug/L	J	SI	
	JAW-80-0319	35 ug/L	J	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	47 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,1-Dichloropropene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2,3-Trichlorobenzene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,2,3-Trichloropropane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,2,4-Trichlorobenzene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,2,4-Trimethylbenzene					

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.33 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	2.7 ug/L	J	SI	
	WBP-99-6-0319	3.9 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	1.9 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2-DCA					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	1.6 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	30 ug/L	J	SI	
	JAW-80-0319	1.4 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-1-0319	0.4 ug/L	U	EB<RL	blank target = 0.16 ug/L
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2-DCB					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2-Dibromo-3-chloropropane					
	EBP-MW13-R0319	1.6 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	1.6 ug/L	UJ	SI	
	FTP-MW4-0319	1.6 ug/L	UJ	SI	
	FTP-MW5-R0319	1.6 ug/L	UJ	SI	
	JAW-23-0319	1.6 ug/L	UJ	SI	
	JAW-58-0319	1.6 ug/L	UJ	SI	
	JAW-60-0319	1.6 ug/L	UJ	SI	
	JAW-80-0319	1.6 ug/L	UJ	SI	
	M-01-0319	1.6 ug/L	UJ	SI	
	WBP-99-5-R0319	1.6 ug/L	UJ	SI	
	WBP-99-6-0319	1.6 ug/L	UJ	SI	
	WBP-MW2-0319	1.6 ug/L	UJ	SI	
	WBP-MW3-0319	1.6 ug/L	UJ	SI	
	WBP-MW9-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-06-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-10-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-11-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	1.6 ug/L	UJ	SI	
1,2-Dibromoethane (EDB)					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2-Dichloropropane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,3,5-Trimethylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.64 ug/L	J	SI	
	WBP-99-6-0319	1.3 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.58 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,3-DCB					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,3-Dichloropropane					
	EBP-MW13-R0319	0.2 ug/L	UJ	SI	
	FJAW-80-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.2 ug/L	UJ	SI	
	FTP-MW4-0319	0.2 ug/L	UJ	SI	
	FTP-MW5-R0319	0.2 ug/L	UJ	SI	
	JAW-23-0319	0.2 ug/L	UJ	SI	
	JAW-58-0319	0.2 ug/L	UJ	SI	
	JAW-60-0319	0.2 ug/L	UJ	SI	
	JAW-80-0319	0.2 ug/L	UJ	SI	
	M-01-0319	0.2 ug/L	UJ	SI	
	WBP-99-5-R0319	0.2 ug/L	UJ	SI	
	WBP-99-6-0319	0.2 ug/L	UJ	SI	
	WBP-MW2-0319	0.2 ug/L	UJ	SI	
	WBP-MW3-0319	0.2 ug/L	UJ	SI	
	WBP-MW9-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.2 ug/L	UJ	SI	
1,4-DCB					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1-Chlorohexane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.31 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
2,2-Dichloropropane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
2-Chlorotoluene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
2-Hexanone					
	EBP-MW13-R0319	4 ug/L	UJ	SI	
	FJAW-80-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	4 ug/L	UJ	SI	
	FTP-MW4-0319	4 ug/L	UJ	SI	
	FTP-MW5-R0319	4 ug/L	UJ	SI	
	JAW-23-0319	4 ug/L	UJ	SI	
	JAW-58-0319	4 ug/L	UJ	SI	
	JAW-60-0319	4 ug/L	UJ	SI	
	JAW-80-0319	4 ug/L	UJ	SI	
	M-01-0319	4 ug/L	UJ	SI	
	WBP-99-5-R0319	4 ug/L	UJ	SI	
	WBP-99-6-0319	4 ug/L	UJ	SI	
	WBP-MW2-0319	4 ug/L	UJ	SI	
	WBP-MW3-0319	4 ug/L	UJ	SI	
	WBP-MW9-0319	4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-11-0319	4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	4 ug/L	UJ	SI	
4-Chlorotoluene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Acetone					
	EBP-MW13-R0319	2.7 ug/L	J	SI	
	FJAW-80-0319	6.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	6.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	6.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	6.4 ug/L	UJ	SI	
	FTP-MW4-0319	6.4 ug/L	UJ	SI	
	FTP-MW5-R0319	6.4 ug/L	UJ	SI	
	JAW-23-0319	6.4 ug/L	UJ	SI	
	JAW-58-0319	6.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-60-0319	6.4 ug/L	UJ	SI	
	JAW-80-0319	6.4 ug/L	UJ	SI	
	M-01-0319	6.4 ug/L	UJ	SI	
	WBP-99-5-R0319	6.4 ug/L	UJ	SI	
	WBP-99-6-0319	6.4 ug/L	UJ	SI	
	WBP-MW2-0319	6.4 ug/L	UJ	SI	
	WBP-MW3-0319	6.4 ug/L	UJ	SI	
	WBP-MW9-0319	6.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	380 ug/L	J	SI	
	WBP-TTMW-10-0319	6.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	6.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	6.4 ug/L	UJ	SI	
Benzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	4.9 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.98 ug/L	J	SI	
	FTA-TT-MW-F05-0319	0.92 ug/L	J	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.87 ug/L	J	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.17 ug/L	J	SI	
	WBP-99-6-0319	0.47 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.18 ug/L	J	SI	
	WBP-TTMW-F11-0319	0.19 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
Bromobenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Bromochloromethane					
	EBP-MW13-R0319	0.2 ug/L	UJ	SI	
	FJAW-80-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.2 ug/L	UJ	SI	
	FTP-MW4-0319	0.2 ug/L	UJ	SI	
	FTP-MW5-R0319	0.2 ug/L	UJ	SI	
	JAW-23-0319	0.2 ug/L	UJ	SI	
	JAW-58-0319	0.2 ug/L	UJ	SI	
	JAW-60-0319	0.2 ug/L	UJ	SI	
	JAW-80-0319	0.2 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	0.2 ug/L	UJ	SI	
	WBP-99-5-R0319	0.2 ug/L	UJ	SI	
	WBP-99-6-0319	0.2 ug/L	UJ	SI	
	WBP-MW2-0319	0.2 ug/L	UJ	SI	
	WBP-MW3-0319	0.2 ug/L	UJ	SI	
	WBP-MW9-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.2 ug/L	UJ	SI	
Bromodichloromethane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Bromoform					
	EBP-MW13-R0319	1 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	1 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	1 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	1 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	1 ug/L	UJ	SI	
	FTP-MW4-0319	1 ug/L	UJ	SI	
	FTP-MW5-R0319	1 ug/L	UJ	SI	
	JAW-23-0319	1 ug/L	UJ	SI	
	JAW-58-0319	1 ug/L	UJ	SI	
	JAW-60-0319	1 ug/L	UJ	SI	
	JAW-80-0319	1 ug/L	UJ	SI	
	M-01-0319	1 ug/L	UJ	SI	
	WBP-99-5-R0319	1 ug/L	UJ	SI	
	WBP-99-6-0319	1 ug/L	UJ	SI	
	WBP-MW2-0319	1 ug/L	UJ	SI	
	WBP-MW3-0319	1 ug/L	UJ	SI	
	WBP-MW9-0319	1 ug/L	UJ	SI	
	WBP-TTMW-06-0319	1 ug/L	UJ	SI	
	WBP-TTMW-10-0319	1 ug/L	UJ	SI	
	WBP-TTMW-11-0319	1 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	1 ug/L	UJ	SI	
Bromomethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-6-0319	1.3 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	3.8 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	5.6 ug/L	J	SI	
	WBP-TTMW-F11-0319	8.4 ug/L	J	SI	
Carbon disulfide					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	68 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.21 ug/L	J	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Carbon tetrachloride					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Chlorobenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Chloroethane					
	EBP-MW13-R0319	1.6 ug/L	UJ	SI	
	FJAW-80-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	2.5 ug/L	J	SI	
	FTA-TT-MW-05-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	1.6 ug/L	UJ	SI	
	FTP-MW4-0319	1.6 ug/L	UJ	SI	
	FTP-MW5-R0319	1.6 ug/L	UJ	SI	
	JAW-23-0319	1.6 ug/L	UJ	SI	
	JAW-58-0319	1.6 ug/L	UJ	SI	
	JAW-60-0319	5.8 ug/L	J	SI	
	JAW-80-0319	1.6 ug/L	UJ	SI	
	M-01-0319	1.6 ug/L	UJ	SI	
	WBP-99-5-R0319	1.6 ug/L	UJ	SI	
	WBP-99-6-0319	1.6 ug/L	UJ	SI	
	WBP-MW2-0319	1.6 ug/L	UJ	SI	
	WBP-MW3-0319	1.6 ug/L	UJ	SI	
	WBP-MW9-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-06-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-10-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-11-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	1.6 ug/L	UJ	SI	
Chloroform					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.35 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-02-0319	6.6 ug/L	U	EB>RL	blank target = 2.3 ug/L
	FTA-TT-MW-03-0319	20 ug/L	U	EB>RL	blank target = 2.3 ug/L

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-59-0319	0.4 ug/L	U	EB>RL	blank target = 3.6 ug/L
	JAW-60-0319	1.8 ug/L	U	EB>RL	blank target = 2.3 ug/L
	JAW-60-0319	1.8 ug/L	J	SI	
	JAW-61-0319	0.4 ug/L	U	EB>RL	blank target = 2.3 ug/L
	JAW-80-0319	0.29 ug/L	U	EB>RL	blank target = 3.6 ug/L
	JAW-80-0319	0.29 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	SA-99-1-0319	1.9 ug/L	U	EB>RL	blank target = 2.3 ug/L
	WBP-99-1-0319	0.4 ug/L	U	EB>RL	blank target = 3.6 ug/L
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	2.1 ug/L	J	SI	
	WBP-TTMW-01-0319	8 ug/L	U	EB>RL	blank target = 3.6 ug/L
	WBP-TTMW-02-0319	16 ug/L	U	EB>RL	blank target = 3.6 ug/L
	WBP-TTMW-06-0319	0.33 ug/L	J	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.51 ug/L	J	SI	
	WBP-TTMW-F11-0319	0.51 ug/L	J	SI	
Chloromethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	2.9 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	4 ug/L	J	SI	
	WBP-TTMW-F11-0319	6.2 ug/L	J	SI	
Cis-1,2-DCE					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	6.3 ug/L	J	SI	
	FTA-TT-MW-01-0319	1 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	190 ug/L	J	SI	
	JAW-80-0319	5.9 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.87 ug/L	J	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	9.6 ug/L	J	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-11-0319	57 ug/L	J	SI	
	WBP-TTMW-F11-0319	56 ug/L	J	SI	
cis-1,3-Dichloropropene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Dibromochloromethane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Dibromomethane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
Dichlorodifluoromethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.33 ug/L	J	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	69 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Ethylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	1.4 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.31 ug/L	J	SI	
	FTA-TT-MW-F05-0319	0.27 ug/L	J	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.7 ug/L	J	SI	
	WBP-99-6-0319	1.9 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.43 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Hexachlorobutadiene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Isopropylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.22 ug/L	J	SI	
	WBP-99-6-0319	0.36 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
m,p-Xylene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.19 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	2.1 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-6-0319	2.9 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	1.1 ug/L	J	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
MEK (2-Butanone)					
	EBP-MW13-R0319	4 ug/L	UJ	SI	
	FJAW-80-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	4 ug/L	UJ	SI	
	FTP-MW4-0319	4 ug/L	UJ	SI	
	FTP-MW5-R0319	4 ug/L	UJ	SI	
	JAW-23-0319	4 ug/L	UJ	SI	
	JAW-58-0319	4 ug/L	UJ	SI	
	JAW-60-0319	4 ug/L	UJ	SI	
	JAW-80-0319	4 ug/L	UJ	SI	
	M-01-0319	4 ug/L	UJ	SI	
	WBP-99-5-R0319	8.1 ug/L	J	SI	
	WBP-99-6-0319	4 ug/L	UJ	SI	
	WBP-MW2-0319	4 ug/L	UJ	SI	
	WBP-MW3-0319	4 ug/L	UJ	SI	
	WBP-MW9-0319	4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	4 ug/L	UJ	SI	
Methyl tert-butyl ether (MTBE)					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Methylene chloride					
	EBP-MW13-R0319	2 ug/L	UJ	SI	
	FJAW-80-0319	2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	2 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	2 ug/L	UJ	SI	
	FTP-MW4-0319	2 ug/L	UJ	SI	
	FTP-MW5-R0319	2 ug/L	UJ	SI	
	JAW-23-0319	2 ug/L	UJ	SI	
	JAW-58-0319	2 ug/L	UJ	SI	
	JAW-60-0319	2 ug/L	UJ	SI	
	JAW-80-0319	2 ug/L	UJ	SI	
	L3AP-FMW4-0818	0.78 ug/L	U	EB<RL	
	L3AP-MW4-0818	0.59 ug/L	U	EB<RL	
	M-01-0319	2 ug/L	UJ	SI	
	WBP-99-5-R0319	2 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-6-0319	2 ug/L	UJ	SI	
	WBP-MW2-0319	2 ug/L	UJ	SI	
	WBP-MW3-0319	2 ug/L	UJ	SI	
	WBP-MW9-0319	2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	2 ug/L	UJ	SI	
MIBK (Methyl isobutyl ketone)					
	EBP-MW13-R0319	3.2 ug/L	UJ	SI	
	FJAW-80-0319	3.2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	3.2 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	3.2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	3.2 ug/L	UJ	SI	
	FTP-MW4-0319	3.2 ug/L	UJ	SI	
	FTP-MW5-R0319	3.2 ug/L	UJ	SI	
	JAW-23-0319	3.2 ug/L	UJ	SI	
	JAW-58-0319	3.2 ug/L	UJ	SI	
	JAW-60-0319	3.2 ug/L	UJ	SI	
	JAW-80-0319	3.2 ug/L	UJ	SI	
	M-01-0319	3.2 ug/L	UJ	SI	
	WBP-99-5-R0319	3.2 ug/L	UJ	SI	
	WBP-99-6-0319	3.2 ug/L	UJ	SI	
	WBP-MW2-0319	3.2 ug/L	UJ	SI	
	WBP-MW3-0319	3.2 ug/L	UJ	SI	
	WBP-MW9-0319	3.2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	3.2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	3.2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	3.2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	3.2 ug/L	UJ	SI	
Naphthalene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	3.2 ug/L	J	SI	
	WBP-99-6-0319	1.6 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	1.3 ug/L	J	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
n-Butylbenzene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.67 ug/L	J	SI	
	WBP-99-6-0319	0.93 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	J	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
n-Propylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.22 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.28 ug/L	J	SI	
	WBP-99-6-0319	0.61 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.23 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
o-Xylene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	1.7 ug/L	J	SI	
	WBP-99-6-0319	2.8 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.62 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
p-Isopropyltoluene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.58 ug/L	J	SI	
	WBP-99-6-0319	0.7 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.56 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
sec-Butylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.17 ug/L	J	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.52 ug/L	J	SI	
	WBP-99-6-0319	0.69 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.49 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Styrene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
TCE					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	2.8 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.17 ug/L	J	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	37 ug/L	J	SI	
	JAW-80-0319	2.5 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.77 ug/L	J	SI	
	WBP-99-6-0319	0.26 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	13 ug/L	J	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-11-0319	54 ug/L	J	SI	
	WBP-TTMW-F11-0319	53 ug/L	J	SI	
tert-Butylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Tetrachloroethene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.81 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.64 ug/L	J	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.38 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-60-0319	1.9 ug/L	J	SI	
	JAW-80-0319	0.75 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Toluene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.18 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	6 ug/L	J	SI	
	WBP-99-6-0319	8.1 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	1.2 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
trans-1,2-DCE					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.58 ug/L	J	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.5 ug/L	J	SI	
	WBP-TTMW-F11-0319	0.5 ug/L	J	SI	
trans-1,3-Dichloropropene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Trichlorofluoromethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Vinyl chloride					
	EBP-MW13-R0319	0.2 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.24 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.2 ug/L	UJ	SI	
	FTP-MW4-0319	0.2 ug/L	UJ	SI	
	FTP-MW5-R0319	0.2 ug/L	UJ	SI	
	JAW-23-0319	0.2 ug/L	UJ	SI	
	JAW-58-0319	0.2 ug/L	UJ	SI	
	JAW-60-0319	1.3 ug/L	J	SI	
	JAW-80-0319	0.2 ug/L	UJ	SI	
	M-01-0319	0.2 ug/L	UJ	SI	
	WBP-99-5-R0319	0.2 ug/L	UJ	SI	
	WBP-99-6-0319	0.2 ug/L	UJ	SI	
	WBP-MW2-0319	0.2 ug/L	UJ	SI	
	WBP-MW3-0319	0.2 ug/L	UJ	SI	
	WBP-MW9-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.2 ug/L	UJ	SI	
Method (Matrix): SW8290 (WATER)					
1,2,3,4,6,7,8,9-Octachlorodibenzofura					
	JAW29-0418	1.8 pg/L	U	LB<RL	
	L9TTMW02-0418	2.8 pg/L	U	LB<RL	
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-d					
	JAW29-0418	9.5 pg/L	U	LB<RL	
	JAW31-0418	3.1 pg/L	U	LB<1/2RL	blank target = 2.89pg/L
	L9MW1-0418	7.1 pg/L	U	LB<RL	
	L9TTMW02-0418	23 pg/L	U	LB<RL	
1,2,3,4,6,7,8-Heptachlorodibenzofura					
	JAW29-0418	0.72 pg/L	U	LB<RL	
	L9MW1-0418	0.46 pg/L	U	LB<RL	
	L9TTMW02-0418	1.8 pg/L	U	LB<RL	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-di					

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8290 (WATER)					
	JAW29-0418	1.6 pg/L	U	LB<RL	
	L9MW1-0418	0.85 pg/L	U	LB<RL	
	L9TTMW02-0418	3.3 pg/L	U	LB<RL	
1,2,3,4,7,8,9-Heptachlorodibenzofura					
	L9TTMW02-0418	8.1 pg/L	U	LB<RL	
1,2,3,4,7,8-Hexachlorodibenzofuran					
	L9TTMW02-0418	1.6 pg/L	U	LB<RL	
1,2,3,4,7,8-Hexachlorodibenzo-p-diox					
	JAW29-0418	1.7 pg/L	U	LB<RL	
	JAW31-0418	2 pg/L	U	LB<1/2RL	blank target = 1.87pg/L
	L9MW1-0418	1.5 pg/L	U	LB<RL	
	L9TTMW02-0418	1.6 pg/L	U	LB<RL	
1,2,3,6,7,8-Hexachlorodibenzofuran					
	L9TTMW02-0418	0.91 pg/L	U	LB<RL	
1,2,3,7,8,9-Hexachlorodibenzofuran					
	JAW29-0418	0.97 pg/L	U	LB<RL	
	L9MW1-0418	0.83 pg/L	U	LB<RL	
	L9TTMW02-0418	10 pg/L	U	LB<RL	
1,2,3,7,8-Pentachlorodibenzofuran					
	L9TTMW02-0418	3.1 pg/L	U	LB<RL	
2,3,7,8-Tetrachlorodibenzo-p-dioxin					
	JAW29-0418	2.3 pg/L	U	LB<RL	
	L9MW1-0418	2.3 pg/L	U	LB<RL	
Total HpCDD					
	JAW29-0418	3.1 pg/L	U	LB<RL	
	JAW31-0418	2.3 pg/L	U	LB<1/2RL	blank target = 0.846pg/L
	L9MW1-0418	2 pg/L	U	LB<RL	
	L9TTMW02-0418	5.9 pg/L	U	LB<RL	
Total HpCDF					
	JAW29-0418	0.72 pg/L	U	LB<RL	
	L9MW1-0418	0.46 pg/L	U	LB<RL	
	L9TTMW02-0418	13 pg/L	U	LB<RL	
Total HxCDD					

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8290 (WATER)					
	JAW29-0418	2.9 pg/L	U	LB<RL	
	JAW31-0418	2 pg/L	U	LB<1/2RL	blank target = 1.87pg/L
	L9MW1-0418	1.5 pg/L	U	LB<RL	
	L9TTMW02-0418	4.7 pg/L	U	LB<RL	
Total HxCDF					
	JAW29-0418	2.3 pg/L	U	LB<RL	
	L9MW1-0418	0.83 pg/L	U	LB<RL	
	L9TTMW02-0418	20 pg/L	U	LB<RL	
Total PeCDF					
	L9TTMW02-0418	5.8 pg/L	U	LB<RL	
Total TCDD					
	JAW29-0418	2.3 pg/L	U	LB<RL	
	L9MW1-0418	2.3 pg/L	U	LB<RL	
Total TCDF					
	JAW29-0418	1.7 pg/L	U	LB<RL	
	L9MW1-0418	1 pg/L	U	LB<RL	
	L9TTMW02-0418	4.6 pg/L	U	LB<RL	
Method (Matrix): SW8330B (WATER)					
1,3,5-Trinitrobenzene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.2 ug/L	J	TEMP>6C	
	L3-DP2-1520-0718	0.035 ug/L	J	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
1,3-Dinitrobenzene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
2,4,6-Trinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8330B (WATER)					
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
2,4-Dinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
2,6-Dinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
2-Amino-4,6-dinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
4-Amino-2,6-dinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
hexahydro-1,3,5-trinitroso-1,3,5-triazi					
	5A-MW4-0718	0.2 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.2 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.24 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.22 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.22 ug/L	UJ	TEMP>6C	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8330B (WATER)					
hexahydro-1,3-dinitroso-5-nitro-1,3,5-					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
hexahydro-1-nitroso-3,5-dinitro-1,3,5-					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
HMX					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.2 ug/L	J	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
m-Nitrotoluene					
	5A-MW4-0718	0.2 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.2 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.24 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.22 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.22 ug/L	UJ	TEMP>6C	
Nitrobenzene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.075 ug/L	J	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
o-Nitrotoluene					
	5A-MW4-0718	0.2 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.2 ug/L	UJ	TEMP>6C	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8330B (WATER)					
	L3-DP1-2530-0718	0.24 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.22 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.22 ug/L	UJ	TEMP>6C	
p-Nitrotoluene					
	5A-MW4-0718	0.2 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.2 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.24 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.22 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.22 ug/L	UJ	TEMP>6C	
RDX					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.058 ug/L	J	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
Tetryl					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	

TABLE 9

Blank Contamination - Qualified Data

pg/L = Undefined Unit in tlkpUnits

ug/L = micrograms per liter

Blank target = concentration of field or laboratory blank.

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

U = The analyte was not detected in the analysis. The associated numerical value is at or below the method detection limit (MDL).

UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

EB<RL	=	Equipment blank concentration less than the RL
EB>RL	=	Equipment blank concentration greater than the RL
LB<1/2RL	=	Laboratory blank contamination less than 1/2 the RL
LB<RL	=	Laboratory blank contamination less than the RL
SI	=	Sample Integrity, VOC vials with >6mm bubbles
TB<RL	=	Trip blank concentration less than RL
TEMP>6C	=	Temperature Blank>6C

TABLE 10

Field Duplicate Precision - Qualified Data

Analyte	Sample Identification	Result	Field Duplicate Qualifier*	Criteria	Validation Comments
Method (Matrix): SW8330B (WATER)					
hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)	WBP-TTMW-11-0319	23 ug/L	J	FD>RPD	
	WBP-TTMW-F11-0319	36 ug/L	J	FD>RPD	

RPD = relative percent difference

ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

Criteria:

FD>RPD = Field duplicate exceeds RPD criteria

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8260B (WATER)					
1,1-Dichloroethene	FJAW-80-0319 / FD	39 ug/L	J	RPD = 21.34 Limit =20	LCSRPD
1,1,2-Trichloro-1,2,2-trifluoroethane	FTP-MW7-0319 / N	0.8 ug/L	J	RPD = 23.9 Limit =20	LCSRPD
1,1-Dichloroethene	JAW-58-0319 / N	1.4 ug/L	J	RPD = 21.34 Limit =20	LCSRPD
	JAW-59-0319 / N	110 ug/L	J	RPD = 21.34 Limit =20	LCSRPD
1,1,2-Trichloro-1,2,2-trifluoroethane	JAW-80-0319 / N	0.64 ug/L	J	RPD = 23.9 Limit =20	LCSRPD
1,1-Dichloroethene	JAW-80-0319 / N	35 ug/L	J	RPD = 21.34 Limit =20	LCSRPD
Carbon disulfide	L3AP-MW1-0818 / N	1.6 ug/L	UJ	%R = 58 LCL=64 UCL=133	LCS<LCL
1,1,2-Trichloro-1,2,2-trifluoroethane	WBP-99-1-0319 / N	1 ug/L	J	RPD = 23.9 Limit =20	LCSRPD
Method (Matrix): SW8290 (WATER)					
1,2,3,4,7,8-HxCDD	L9TTMW02-0418 / N	1.6 pg/L	J	%R = 130 LCL=80 UCL=126	LCS>UCL
Method (Matrix): SW8330B (WATER)					
2-Amino-4,6-dinitrotoluene	CCLTTMW004-0418 / N	0.12 ug/L	UJ	%R = 56 LCL= 79 UCL= 120	LCS<LCL
4-Amino-2,6-dinitrotoluene	CCLTTMW004-0418 / N	0.12 ug/L	UJ	%R = 71 LCL= 76 UCL= 125	LCS<LCL
	CCLTTMW004-0418 / N	0.12 ug/L	UJ	%R = 74 LCL= 76 UCL= 125	LCSD<LCL
4-Nitrotoluene	CONTG-FD1 / FD	0.41 ug/L	UJ	%R = 41 LCL= 77 UCL= 127	LCS<LCL
Nitrobenzene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 39 LCL= 65 UCL= 134	LCS<LCL
2-Amino-4,6-dinitrotoluene	CONTG-FD1 / FD	0.18 ug/L	J	%R = 56 LCL= 79 UCL= 120	LCS<LCL
2-Nitrotoluene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 66 LCL= 70 UCL= 127	LCS<LCL
4-Amino-2,6-dinitrotoluene	CONTG-FD1 / FD	0.25 ug/L	J	%R = 65 LCL= 76 UCL= 125	LCS<LCL
3-Nitrotoluene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 37 LCL= 79 UCL= 120	LCS<LCL
1,3-Dinitrobenzene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 74 LCL= 78 UCL= 120	LCSD<LCL
4-Amino-2,6-dinitrotoluene	CONTG-FD1 / FD	0.25 ug/L	J	%R = 58 LCL= 76 UCL= 125	LCSD<LCL
2,4-Dinitrotoluene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 69 LCL= 78 UCL= 120	LCSD<LCL
2,6-Dinitrotoluene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 69 LCL= 77 UCL= 127	LCSD<LCL
2-Amino-4,6-dinitrotoluene	CONTG-FD1 / FD	0.18 ug/L	J	%R = 62 LCL= 79 UCL= 120	LCSD<LCL
2-Nitrotoluene	EBP-MW17-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	EBP-MW17-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	EBP-MW17-0319 / N	0.41 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
	EDA-SW01-0319 / N	0.44 ug/L	UJ	%R = 69 LCL=73 UCL=125	LCS<LCL
2-Nitrotoluene	EDA-SW01-0319 / N	0.22 ug/L	UJ	%R = 66 LCL=70 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	EDA-SW01-0319 / N	0.13 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Amino-4,6-dinitrotoluene	EDA-SW01-0319 / N	0.13 ug/L	UJ	%R = 70 LCL=79 UCL=120	LCS<LCL
3-Nitrotoluene	EDA-SW01-0319 / N	0.44 ug/L	UJ	RPD = 33.43 Limit =20	LCSRPD
2-Nitrotoluene	EDA-SW01-0319 / N	0.22 ug/L	UJ	RPD = 34.48 Limit =20	LCSRPD
Nitrobenzene	EDA-SW01-0319 / N	0.22 ug/L	UJ	RPD = 23.91 Limit =20	LCSRPD

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
4-Nitrotoluene	EDA-SW01-0319 / N	0.44 ug/L	UJ	RPD = 31.45 Limit =20	LCSRPD
2-Amino-4,6-dinitrotoluene	EDA-SW01-0319 / N	0.13 ug/L	UJ	RPD = 26.46 Limit =20	LCSRPD
4-Amino-2,6-dinitrotoluene	EDA-SW01-0319 / N	0.13 ug/L	UJ	RPD = 25.97 Limit =20	LCSRPD
2-Amino-4,6-dinitrotoluene	EDA-SW02-0319 / N	0.13 ug/L	UJ	%R = 70 LCL=79 UCL=120	LCS<LCL
2-Nitrotoluene	EDA-SW02-0319 / N	0.22 ug/L	UJ	%R = 66 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	EDA-SW02-0319 / N	0.43 ug/L	UJ	%R = 69 LCL=73 UCL=125	LCS<LCL
4-Amino-2,6-dinitrotoluene	EDA-SW02-0319 / N	0.13 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	EDA-SW02-0319 / N	0.43 ug/L	UJ	RPD = 31.45 Limit =20	LCSRPD
2-Amino-4,6-dinitrotoluene	EDA-SW02-0319 / N	0.13 ug/L	UJ	RPD = 26.46 Limit =20	LCSRPD
2-Nitrotoluene	EDA-SW02-0319 / N	0.22 ug/L	UJ	RPD = 34.48 Limit =20	LCSRPD
4-Amino-2,6-dinitrotoluene	EDA-SW02-0319 / N	0.13 ug/L	UJ	RPD = 25.97 Limit =20	LCSRPD
3-Nitrotoluene	EDA-SW02-0319 / N	0.43 ug/L	UJ	RPD = 33.43 Limit =20	LCSRPD
Nitrobenzene	EDA-SW02-0319 / N	0.22 ug/L	UJ	RPD = 23.91 Limit =20	LCSRPD
4-Nitrotoluene	G-14-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
Nitrobenzene	G-14-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Amino-2,6-dinitrotoluene	G-14-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Nitrotoluene	G-14-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	G-14-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Nitrotoluene	G15-0418 / N	0.42 ug/L	UJ	%R = 41 LCL= 77 UCL= 127	LCS<LCL
2-Nitrotoluene	G15-0418 / N	0.21 ug/L	UJ	%R = 66 LCL= 70 UCL= 127	LCS<LCL
4-Amino-2,6-dinitrotoluene	G15-0418 / N	0.23 ug/L	J	%R = 65 LCL= 76 UCL= 125	LCS<LCL
3-Nitrotoluene	G15-0418 / N	0.21 ug/L	UJ	%R = 37 LCL= 73 UCL= 125	LCS<LCL
2-Amino-4,6-dinitrotoluene	G15-0418 / N	0.18 ug/L	J	%R = 56 LCL= 79 UCL= 120	LCS<LCL
Nitrobenzene	G15-0418 / N	0.21 ug/L	UJ	%R = 39 LCL= 65 UCL= 134	LCS<LCL
2-Amino-4,6-dinitrotoluene	G15-0418 / N	0.18 ug/L	J	%R = 62 LCL= 79 UCL= 120	LCSD<LCL
2,6-Dinitrotoluene	G15-0418 / N	0.21 ug/L	UJ	%R = 69 LCL= 77 UCL= 127	LCSD<LCL
2,4-Dinitrotoluene	G15-0418 / N	0.21 ug/L	UJ	%R = 69 LCL= 78 UCL= 120	LCSD<LCL
4-Amino-2,6-dinitrotoluene	G15-0418 / N	0.23 ug/L	J	%R = 58 LCL= 76 UCL= 125	LCSD<LCL
1,3-Dinitrobenzene	G15-0418 / N	0.21 ug/L	UJ	%R = 74 LCL= 78 UCL= 120	LCSD<LCL
4-Amino-2,6-dinitrotoluene	G47-0418 / N RE	0.12 ug/L	UJ	%R = 71 LCL= 76 UCL= 125	LCS<LCL
2-Amino-4,6-dinitrotoluene	G47-0418 / N RE	0.12 ug/L	UJ	%R = 73 LCL= 79 UCL= 120	LCS<LCL
2,4-Dinitrotoluene	G47-0418 / N RE	0.21 ug/L	UJ	%R = 77 LCL= 78 UCL= 120	LCS<LCL
4-Amino-2,6-dinitrotoluene	GZ-2-1118 / N	0.1 ug/L	UJ	%R = 75 LCL=76 UCL=125	LCS<LCL
	GZ-2-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCSD<LCL
	GZ-2A-1118 / N	5.4 ug/L	J	%R = 75 LCL=76 UCL=125	LCS<LCL

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
4-Amino-2,6-dinitrotoluene	GZ-2A-1118 / N	5.4 ug/L	J	%R = 67 LCL=76 UCL=125	LCSD<LCL
3-Nitrotoluene	GZ-3-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
Nitrobenzene	GZ-3-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Amino-2,6-dinitrotoluene	GZ-3-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Nitrotoluene	GZ-3-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
4-Nitrotoluene	GZ-3-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	JAW-40-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	JAW-40-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
3-Nitrotoluene	JAW-40-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
2-Nitrotoluene	JAW-40-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
Nitrobenzene	JAW-40-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Amino-2,6-dinitrotoluene	JAW-41-1118 / N	0.1 ug/L	UJ	%R = 75 LCL=76 UCL=125	LCS<LCL
	JAW-41-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCSD<LCL
Nitrobenzene	JAW-47-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Nitrotoluene	JAW-47-1118 / N	0.21 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	JAW-47-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Nitrotoluene	JAW-47-1118 / N	0.21 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	JAW-47-1118 / N	0.21 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
2-Nitrotoluene	JAW-52-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	JAW-52-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Nitrotoluene	JAW-52-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
Nitrobenzene	JAW-52-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Amino-2,6-dinitrotoluene	JAW-52-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
Nitrobenzene	L1-MW102-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
2-Nitrotoluene	L1-MW102-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-MW102-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-MW102-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	L1-MW102-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
2-Nitrotoluene	L1-MW103-0319 / N	0.21 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	L1-MW103-0319 / N	0.21 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	L1-MW103-0319 / N	0.41 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	L1-MW104-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-MW104-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
Nitrobenzene	L1-MW104-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Nitrotoluene	L1-MW104-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
4-Amino-2,6-dinitrotoluene	L1-MW104-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
3-Nitrotoluene	L1-MW-105-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
2-Nitrotoluene	L1-MW-105-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-MW-105-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
Nitrobenzene	L1-MW-105-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Nitrotoluene	L1-MW-105-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
2-Nitrotoluene	L1-MW106-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-MW106-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-MW106-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	L1-MW106-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
Nitrobenzene	L1-MW106-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
2-Nitrotoluene	L1-TTMW-100-1118 / N	0.23 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-TTMW-100-1118 / N	0.23 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-TTMW-100-1118 / N	0.11 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	L1-TTMW-100-1118 / N	0.23 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
Nitrobenzene	L1-TTMW-100-1118 / N	0.11 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
	L1-TTMW-101-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
2-Nitrotoluene	L1-TTMW-101-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-TTMW-101-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Nitrotoluene	L1-TTMW-101-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-TTMW-101-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Nitrotoluene	L3AP-TW19-01-3545-041	0.21 ug/L	UJ	%R = 68 LCL=70 UCL=127	LCS<LCL
	L3AP-TW19-02-3545-041	0.21 ug/L	UJ	%R = 68 LCL=70 UCL=127	LCS<LCL
	L3AP-TW19-03-3545-041	0.21 ug/L	UJ	%R = 68 LCL=70 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	LI-MW107-1118 / N	0.1 ug/L	UJ	%R = 75 LCL=76 UCL=125	LCS<LCL
	LI-MW107-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCSD<LCL
2-Nitrotoluene	NBPLF-MW3-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	NBPLF-MW3-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	NBPLF-MW3-0319 / N	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-99-4-0319 / N	0.2 ug/L	UJ	%R = 67 LCL=70 UCL=127	LCS<LCL
	WBP-99-6-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-99-6-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-99-6-0319 / N	0.41 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-MW1-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	WBP-MW1-0319 / N	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
2-Nitrotoluene	WBP-MW1-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
	WBP-MW3-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-MW3-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-MW3-0319 / N	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-MW8-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	WBP-MW8-0319 / N	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-MW8-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
	WBP-MW9-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-MW9-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-MW9-0319 / N	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-05B-0319 /	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	WBP-TTMW-05B-0319 /	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-05B-0319 /	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
	WBP-TTMW-06-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-TTMW-06-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-TTMW-06-0319 / N	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-10-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-TTMW-10-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-TTMW-10-0319 / N	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-11-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-TTMW-11-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-TTMW-11-0319 / N	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-F11-0319 /	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-TTMW-F11-0319 /	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-TTMW-F11-0319 /	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL

%R = percent recovery
pg/L = Undefined Unit in tlkpUnits
ug/L = micrograms per liter

QAQC Type

N = Normal Environmental Sample
FD = Field Duplicate

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.
UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

LCS<LCL	=	LCS recovery less than lower control limit
LCS>UCL	=	LCS recovery greater than upper control limit
LCSD<LCL	=	LCSD recovery less than the lower control limit
LCSRPD	=	LCSD RPD criteria exceeded

TABLE 12

Calibration Criteria - Qualified Data

Analyte	Sample Identification	Result	Calibration Qualifier*	Criteria	Validation Comments
Method (Matrix): SW8260B (WATER)					
1,2-Dibromo-3-chloropropane	EDA-SW01-0319	1.6 ug/L	UJ	CCV<LCL	
	EDA-SW02-0319	1.6 ug/L	UJ	CCV<LCL	
	FJAW-80-0319	1.6 ug/L	UJ	CCV<LCL	
	FTP-MW7-0319	1.6 ug/L	UJ	CCV<LCL	
	FTP-MW8-0319	1.6 ug/L	UJ	CCV<LCL	
	JAW-58-0319	1.6 ug/L	UJ	CCV<LCL	
	JAW-59-0319	1.6 ug/L	UJ	CCV<LCL	
	JAW-80-0319	1.6 ug/L	UJ	CCV<LCL	
	WBP-99-1-0319	1.6 ug/L	UJ	CCV<LCL	
Bromoform	EDA-SW01-0319	1 ug/L	UJ	CCV<LCL	
	EDA-SW02-0319	1 ug/L	UJ	CCV<LCL	
	FJAW-80-0319	1 ug/L	UJ	CCV<LCL	
	FTP-MW7-0319	1 ug/L	UJ	CCV<LCL	
	FTP-MW8-0319	1 ug/L	UJ	CCV<LCL	
	JAW-58-0319	1 ug/L	UJ	CCV<LCL	
	JAW-59-0319	1 ug/L	UJ	CCV<LCL	
	JAW-80-0319	1 ug/L	UJ	CCV<LCL	
	WBP-99-1-0319	1 ug/L	UJ	CCV<LCL	
Bromomethane	EDA-SW01-0319	0.8 ug/L	UJ	CCV<LCL	
	EDA-SW02-0319	0.8 ug/L	UJ	CCV<LCL	
	FJAW-80-0319	0.8 ug/L	UJ	CCV<LCL	
	FTA-TT-MW-02-0319	32 ug/L	UJ	CCV<LCL	
	FTP-MW7-0319	0.8 ug/L	UJ	CCV<LCL	
	FTP-MW8-0319	0.8 ug/L	UJ	CCV<LCL	
	JAW-58-0319	0.8 ug/L	UJ	CCV<LCL	
	JAW-59-0319	0.8 ug/L	UJ	CCV<LCL	
	JAW-80-0319	0.8 ug/L	UJ	CCV<LCL	
	L3AP-TW19-01-3545-0419	0.8 ug/L	UJ	CCV<LCL	
	L3AP-TW19-02-3545-0419	0.8 ug/L	UJ	CCV<LCL	
	L3AP-TW19-03-3545-0419	0.8 ug/L	UJ	CCV<LCL	
	WBP-99-1-0319	0.8 ug/L	UJ	CCV<LCL	
	WBP-MW1-0319	0.8 ug/L	UJ	CCV<LCL	
	WBP-TTMW-05B-0319	0.8 ug/L	UJ	CCV<LCL	

%D = percent difference

ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

CCV<LCL = Continuing calibration recovery less than lower control limit

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
E218.6	Hexavalent Chromium	UG/L	17	9	8		2			100	100
SW6020	Aluminum	MG/L	2	2						100	100
	Aluminum, dissolved	MG/L	2	1	1					100	100
	Antimony	MG/L	2		2					100	100
	Antimony, dissolved	MG/L	2		2					100	100
	Arsenic	MG/L	37	7	30		3			100	100
	Arsenic, dissolved	MG/L	2		2					100	100
	Barium	MG/L	32	32			5			100	100
	Barium, dissolved	MG/L	2	2						100	100
	Beryllium	MG/L	2		2					100	100
	Beryllium, dissolved	MG/L	2		2					100	100
	Cadmium	MG/L	32	3	29		1			100	100
	Cadmium, dissolved	MG/L	2		2					100	100
	Calcium	MG/L	2	2			1			100	100
	Calcium, dissolved	MG/L	2	2			1			100	100
	Chromium	MG/L	32	1	31		1			100	100
	Chromium, dissolved	MG/L	2		2					100	100
	Cobalt	MG/L	2		2					100	100
	Cobalt, dissolved	MG/L	2		2					100	100
	Copper	MG/L	2	1	1		1			100	100
	Copper, dissolved	MG/L	2	1	1		1			100	100
	Iron	MG/L	2	2						100	100
	Iron, dissolved	MG/L	2	2			1			100	100
	Lead	MG/L	32	3	29		2			100	100
	Lead, dissolved	MG/L	2		2					100	100
	Magnesium	MG/L	2	2			1			100	100
	Magnesium, dissolved	MG/L	2	2			1			100	100
	Manganese	MG/L	2	2			1			100	100
	Manganese, dissolved	MG/L	2	2						100	100
	Molybdenum, dissolved	MG/L	2		2					100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
			Number of Occurrences								
SW6020	Molydbenum	MG/L	2	1	1		1			100	100
	Nickel	MG/L	2	1	1		1			100	100
	Nickel, dissolved	MG/L	2		2					100	100
	Potassium	MG/L	2	2			1			100	100
	Potassium, dissolved	MG/L	2	2			1			100	100
	Selenium	MG/L	32	3	29		3			100	100
	Selenium, dissolved	MG/L	2		2					100	100
	Silver	MG/L	32		32					100	100
	Silver, dissolved	MG/L	2		2					100	100
	Sodium	MG/L	2	2			1			100	100
	Sodium, dissolved	MG/L	2	2			1			100	100
	Thallium	MG/L	2		2					100	100
	Thallium, dissolved	MG/L	2		2					100	100
	Vanadium	MG/L	2	1	1		1			100	100
	Vanadium, dissolved	MG/L	2		2					100	100
	Zinc	MG/L	2		2					100	100
	Zinc, dissolved	MG/L	2	1	1		1			100	100
SW7470A	Mercury, Dissolved	UG/L	2		2					100	100
	Mercury, Total	UG/L	32		32					100	100
SW8082	Aroclor-1016	MG/KG	4		4		1			100	100
	Aroclor-1221	MG/KG	4		4		1			100	100
	Aroclor-1232	MG/KG	4		4		1			100	100
	Aroclor-1242	MG/KG	4		4		1			100	100
	Aroclor-1248	MG/KG	4		4		1			100	100
	Aroclor-1254	MG/KG	4		4		1			100	100
	Aroclor-1260	MG/KG	4		4		1			100	100
SW8151A	Pentachlorophenol	UG/L	3		3		3			100	100
SW8260B	1,1,1,2-Tetrachloroethane	UG/L	64		64		21			100	100
	1,1,1-TCA	UG/L	64	16	48		26			100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences: Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
SW8260B	1,1,2,2-Tetrachloroethane	UG/L	64		64		21			100	100
	1,1,2-TCA	UG/L	64	4	60		22			100	100
	1,1,2-Trichloro-1,2,2-trifluoroethane	UG/L	44	13	31		18			100	100
	1,1-DCA	UG/L	64	23	41		27			100	100
	1,1-DCE	UG/L	63	19	44		25			100	100
	1,1-Dichloropropene	UG/L	64		64		21			100	100
	1,2,3-Trichlorobenzene	UG/L	64		64		21			100	100
	1,2,3-Trichloropropane	UG/L	64		64		21			100	100
	1,2,4-Trichlorobenzene	UG/L	64		64		21			100	100
	1,2,4-Trimethylbenzene	UG/L	64	12	52		26			100	100
	1,2-DCA	UG/L	64	11	53		28			100	100
	1,2-DCB	UG/L	64	1	63		22			100	100
	1,2-Dibromo-3-chloropropane	UG/L	64		64		27			100	100
	1,2-Dibromoethane (EDB)	UG/L	64		64		21			100	100
	1,2-Dichloropropane	UG/L	64	1	63		22			100	100
	1,3,5-Trimethylbenzene	UG/L	64	8	56		24			100	100
	1,3-DCB	UG/L	64		64		21			100	100
	1,3-Dichloropropane	UG/L	64		64		21			100	100
	1,4-DCB	UG/L	64		64		21			100	100
	1-Chlorohexane	UG/L	64	2	62		22			100	100
	2,2-Dichloropropane	UG/L	64		64		21			100	100
	2-Chlorotoluene	UG/L	64		64		21			100	100
	2-Hexanone	UG/L	64	1	63		22			100	100
	4-Chlorotoluene	UG/L	64		64		21			100	100
	Acetone	UG/L	64	14	50		25			100	100
	Benzene	UG/L	64	13	51		23			100	100
	Bromobenzene	UG/L	64		64		21			100	100
	Bromochloromethane	UG/L	64		64		21			100	100
	Bromodichloromethane	UG/L	64	2	62		23			100	100
	Bromoform	UG/L	64		64		27			100	100
	Bromomethane	UG/L	64	5	59		34			100	100

TABLE 13
Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences: Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
SW8260B	Carbon disulfide	UG/L	64	3	61		23			100	100
	Carbon tetrachloride	UG/L	64		64		21			100	100
	Chlorobenzene	UG/L	64		64		21			100	100
	Chloroethane	UG/L	63	5	58		21			100	100
	Chloroform	UG/L	64	16	48		29			100	100
	Chloromethane	UG/L	64	3	61		21			100	100
	Cis-1,2-DCE	UG/L	64	20	44		27			100	100
	cis-1,3-Dichloropropene	UG/L	64		64		21			100	100
	Dibromochloromethane	UG/L	64	1	63		22			100	100
	Dibromomethane	UG/L	64		64		21			100	100
	Dichlorodifluoromethane	UG/L	64	9	55		23			100	100
	Ethylbenzene	UG/L	64	11	53		22			100	100
	Hexachlorobutadiene	UG/L	64		64		21			100	100
	Isopropylbenzene	UG/L	64	4	60		22			100	100
	m,p-Xylene	UG/L	64	10	54		23			100	100
	MEK (2-Butanone)	UG/L	64	6	58		23			100	100
	Methyl tert-butyl ether (MTBE)	UG/L	64		64		21			100	100
	Methylene chloride	UG/L	64	5	59		23			100	100
	MIBK (Methyl isobutyl ketone)	UG/L	64	4	60		22			100	100
	Naphthalene	UG/L	64	6	58		22			100	100
	n-Butylbenzene	UG/L	64	4	60		22			100	100
	n-Propylbenzene	UG/L	64	6	58		22			100	100
	o-Xylene	UG/L	64	8	56		22			100	100
	p-Isopropyltoluene	UG/L	64	8	56		24			100	100
	sec-Butylbenzene	UG/L	64	5	59		21			100	100
	Styrene	UG/L	64		64		21			100	100
	TCE	UG/L	64	19	45		29			100	100
	tert-Butylbenzene	UG/L	64		64		21			100	100
	Tetrachloroethene	UG/L	64	10	54		24			100	100
	Toluene	UG/L	64	14	50		26			100	100
	trans-1,2-DCE	UG/L	64	4	60		22			100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

			Number of Occurrences								
Method	**Analyte**	**Units**	**Analyses**	**Detects**	**Non-detects**	**Blank Flags**	**J-Flags**	**Contractor R-Flags**	**Total R-Flags**	**Contractor Completeness (%)**	**Overall Completeness (%)**
SW8260B	trans-1,3-Dichloropropene	UG/L	64		64		21			100	100
	Trichlorofluoromethane	UG/L	64		64		21			100	100
	Vinyl chloride	UG/L	64	5	59		22			100	100
SW8270-SIM	Pentachlorophenol	UG/L	3	3						100	100
SW8290	1,2,3,4,6,7,8,9-Octachlorodibenzofuran	PG/L	4	1	3		1			100	100
	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	1,2,3,4,6,7,8-Heptachlorodibenzofuran	PG/L	4	1	3		1			100	100
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	1,2,3,4,7,8,9-Heptachlorodibenzofuran	PG/L	4		4					100	100
	1,2,3,4,7,8-Hexachlorodibenzofuran	PG/L	4		4					100	100
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	1,2,3,6,7,8-Hexachlorodibenzofuran	PG/L	4	1	3		1			100	100
	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	PG/L	4	1	3		1			100	100
	1,2,3,7,8,9-Hexachlorodibenzofuran	PG/L	4		4					100	100
	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	PG/L	4	1	3		1			100	100
	1,2,3,7,8-Pentachlorodibenzofuran	PG/L	4		4					100	100
	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	2,3,4,6,7,8-Hexachlorodibenzofuran	PG/L	4	1	3		1			100	100
	2,3,4,7,8-Pentachlorodibenzofuran	PG/L	4		4					100	100
	2,3,7,8-Tetrachlorodibenzofuran	PG/L	1		1					100	100
	2,3,7,8-Tetrachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	Total HpCDD	PG/L	4		4					100	100
	Total HpCDF	PG/L	4	1	3		1			100	100
	Total HxCDD	PG/L	4		4					100	100
	Total HxCDF	PG/L	4		4					100	100
	Total PeCDD	PG/L	4		4					100	100
	Total PeCDF	PG/L	4		4					100	100
	Total TCDD	PG/L	4		4					100	100
	Total TCDF	PG/L	4		4					100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences: Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
SW8330B	1,3,5-Trinitrobenzene	UG/L	212	15	197		46			100	100
	1,3-Dinitrobenzene	UG/L	210	5	205		45			100	100
	2,4,6-Trinitrotoluene	UG/L	211	5	206		43			100	100
	2,4-Dinitrotoluene	UG/L	210	3	207		40			100	100
	2,6-Dinitrotoluene	UG/L	210	8	202		44			100	100
	2-Amino-4,6-dinitrotoluene	UG/L	210	17	193		53			100	100
	4-Amino-2,6-dinitrotoluene	UG/L	209	28	181		54			100	100
	hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)	UG/L	205	25	180		49			100	100
	hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)	UG/L	207	33	174		61			100	100
	hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)	UG/L	208	51	157		58			100	100
	HMX	UG/L	191	65	126		62			100	100
	m-Nitrotoluene	UG/L	210	3	207		58			100	100
	Nitrobenzene	UG/L	210	7	203		46			100	100
	o-Nitrotoluene	UG/L	210	2	208		60			100	100
	p-Nitrotoluene	UG/L	210	3	207		45			100	100
	RDX	UG/L	182	54	128		46			100	100
	Tetryl	UG/L	212	6	206		46			100	100

% = Percent
J-Flags = Estimated results
R-Flags = Rejected results
mg/Kg = milligrams per kilogram
mg/L = milligrams per liter
pg/L = Undefined Unit in tlkpUnits
UG/L = micrograms per liter

Data Quality Evaluation Report

This report contains the Data Quality Evaluation for groundwater and surface water samples collected December 11, 2019, through June 6, 2020, as part of the Remedial Investigation at the Iowa Army Ammunition Plant, Middletown, Iowa. The report evaluates whether the analytical data obtained in the investigation are of sufficient quality and quantity to accomplish the project objectives.

Abbreviations and Acronyms

DL	detection limit
FD	field duplicate
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
MS/MSD	matrix spike/matrix spike duplicate
PARCC	precision, accuracy, representativeness, completeness and comparability
PCB	polychlorinated biphenyl
QAPP	*Remedial Investigation at Iowa Army Ammunitions Plan, Middletown, Iowa*, (CH2M, 2017)
QC	quality control
RPD	relative percent difference
SDG	sample delivery group
SVOC	semivolatile organic compounds
TA	TestAmerica Laboratory
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compounds

1.0 Introduction

This Data Quality Evaluation Report contains an assessment of the quality and usability of analytical data from groundwater and surface water samples collected at the Iowa Army Ammunition Plant, Middletown, Iowa project site.

The analytical work was conducted in accordance with the project-specific quality assurance project plan, *Remedial Investigation at the Iowa Army Ammunition Plant, Middletown, Iowa* (QAPP) (CH2M 2017).

The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability and completeness (PARCC) as described in the QAPP. This report is intended as a general data quality assessment designed to summarize data issues.

1.1 Analytical Laboratories and Analytical Methods

The samples were collected and shipped via overnight carrier to TestAmerica (TA) Laboratories at Arvada, Colorado or St. Louis, Missouri. Samples collected for hexavalent chromium were shipped to Eurofins Laboratory in Lancaster, Pennsylvania (TA is a subsidiary of Eurofins). Samples for pentachlorophenol were shipped directly to TA in Savanna, Georgia. The samples were analyzed by one or more of the methods listed below:

- Volatile organic compounds (VOCs) by USEPA Method SW8260B
- Metals by USEPA SW6020
- Mercury by USEPA SW7470A
- Hexavalent Chromium by USEPA 218.6
- Explosives by USEPA SW8330B
- Pentachlorophenol by USEPA SW8151A

Nineteen sample delivery groups (SDGs) were evaluated for data quality. Table 1 provides a listing of the SDGs, sample identifications and collection and analysis chronology associated with the project samples.

2.0 Field Sample Collection

The fieldwork was conducted December 11, 2019, through June 10, 2020. Twenty-nine groundwater samples and six groundwater field duplicates as well as 12 surface water samples. No surface water field duplicates were collected.

Matrix spike/matrix spike duplicates (MS/MSD) and equipment blanks were collected at the required frequency for the sampling effort. Trip blanks were included with sample coolers containing VOCs. Table 2 includes a summary of the field samples collected by date.

3.0 Data Review and Validation Process

3.1 Data Validation Definition

Analytical data from this investigation were evaluated as described in the QAPP. One hundred percent of definitive analytical results were validated, Stage 2B. The assessment of definitive data includes a review of the following laboratory summary forms as defined in the QAPP:

- Chain-of-custody documentation

- Holding time compliance
- Sample results and detection limit checks
- QC sample frequencies
- Blanks (method, field, calibration)
- Laboratory control sample recoveries
- Surrogate spike recoveries
- MS/MSD recoveries and precision
- Initial and continuing calibration summary information
- Internal Standards
- Tuning criteria
- Confirmation column criteria (where applicable) precision
- Interference check standards
- Field duplicate precision
- Serial dilutions
- Post digestion spikes
- Case narrative review, laboratory flagging review, and other method-specific criteria

3.2 Overall Data Validation Findings

An overall summary of the data validation is contained in the following sections and presented in Table 3. Table 3 is presented so that each validation flag applied to a method/matrix/analyte is shown, to provide the percentage of results impacted by a specific data quality condition or flag, with respect to the total results available for any target analyte/matrix. Only out-of-control conditions noted during the data validation are discussed in Table 3 and in the following subsections.

3.3 Results Detected Between the Detection Limit and Reporting Limit

Analytes that were detected at concentrations greater than the detection limit (DL), but less than the limit of quantitation (LOQ), were qualified as “J” per the QAPP to reflect the uncertainty associated with concentrations of analytical data between the DL and the LOQ. Non-detected sample results were reported to the limit of detection (LOD).

3.4 Holding Time

Overall, holding time criteria were met with the following exceptions:

- The sample preparation hold time of seven days for pentachlorophenol by Method SW8151A exceeded criteria in two samples indicating a possible significant low bias. The nondetected results were flagged “X”, indicating the data may not be usable. The samples were re-collected at a later date and analyzed within hold time criteria.
- One VOC sample was received with a pH greater than 2. The sample was analyzed past the hold time criteria of seven days for unpreserved samples, resulting in the data being qualified as estimated. The associated results were qualified as estimated nondetected concentrations and flagged “UJ”.

The qualified results are shown in Table 4.

3.5 Matrix Spike/Matrix Spike Duplicate

MS/MSD samples were analyzed as required and accuracy and precision criteria were in control with the following exceptions:

- One sample exceeded the MSD with a high bias for aluminum. The data were qualified as estimated detected results and flagged “J” in the respective parent sample.
- Several analytes were recovered less than the lower control limit in a few MS and/or MSD samples for pentachlorophenol, VOCs and explosives, indicating a possible low bias The data were qualified as estimated detected and nondetected results and flagged “J/UJ”, respectively, in the respective parent samples.

Qualified results are shown in Table 5.

3.6 Postdigestion Spikes, Serial Dilutions

Postdigestion spike (PDS) samples or serial dilutions were analyzed as required and criteria were met with the following exceptions:

- Two metals samples exceeded post digestion spike or serial dilutions for barium, iron or manganese. In addition, one sample exceeded the ICSA check requirements for cadmium. The data were qualified as estimated detected results and flagged “J” in the respective parent samples.

Qualified results are shown in Table 5.

3.7 Laboratory Control Sample

LCS/LCSDs were analyzed as required and accuracy and precision criteria were met with the following exceptions:

- Two analytes were recovered less than the lower control limits in one groundwater LCS associated with VOC analyses, indicating a possible low bias. The data were qualified as estimated nondetected results and flagged “UJ” in the associated sample.

Qualified results are shown in Table 6.

3.8 Surrogate Spikes

Surrogates were added to the samples for methods requiring their use and acceptance criteria were met with the following exceptions:

- The surrogates were recovered less than the lower control limit in three groundwater samples associated with the explosive analysis, indicating a possible low bias. The data were qualified as estimated detected and nondetected results and flagged “J/UJ”.
- Surrogates were recovered greater than the upper control limit in several groundwater samples associated with the explosive analysis, indicating a possible high bias. The associated nondetected results were not qualified per the QAPP.

When surrogate spikes were out of control, reanalysis of the samples was performed to confirm the condition.

Qualified data are shown in Table 7.

3.9 Blanks

Method blanks, calibration blanks and field blanks were analyzed as required and were free of contamination with the following exceptions:

- Nickel was detected in an equipment blank less than the LOQ. The data were qualified as nondetected results and flagged "U" when the associated sample concentrations were less than five times the blank concentration.
- Thallium was detected in a calibration blank less than the LOQ. The data were qualified as nondetected results and flagged "U" when the associated sample concentrations were less than five times the blank concentrations.

The qualified results are shown in Table 8.

3.10 Confirmation

The RPD between the primary column and the confirmation column exceeded criteria for several analytes in multiple samples associated with the explosive analysis in groundwater and surface water. The results were qualified as estimated detected concentrations and flagged "J".

The qualified results are shown in Table 9.

3.11 Calibrations

Initial and continuing calibration analyses were performed as required by the methods and acceptance criteria were met with the following exceptions:

- The percent difference (%D) for a few VOC and explosive analytes were less than criteria in several continuing calibration verification standards indicating a possible low bias. The data were qualified as estimated detected or nondetected results and flagged "J/UJ", respectively, in the associated samples.

Qualified results are shown in Table 10.

4.0 Summary of Precision, Accuracy, Representativeness, Comparability, and Completeness

The quality of the field sampling efforts and laboratory results were evaluated for compliance with project data quality objectives through a review of overall PARCC. Procedures used to assess PARCC are in accordance with the respective analytical methods and the QAPP requirements.

4.1 Precision

Precision of the data were verified through the review of the field and laboratory data quality indicators that include FD, LCS/LCSD, MS/MSD, serial dilution and confirmation RPDs. There were a few instances where samples were qualified for MS/MSD, serial dilution and/or confirmation RPD issues; however, overall precision was in control.

4.2 Accuracy

Accuracy of the data was verified through the review of the calibration data, LCS/LCSD, internal standard, surrogate, post digestion spike and MS/MSD recoveries, as well as the evaluation of method/calibration/field blank data. Although a few analytes were qualified as estimated due to blank contamination, calibration, LCS, surrogate, PDS and/or MS/MSD issues, overall accuracy was in control.

4.3 Representativeness

Sample data are representative of the site conditions at the time of sample collection. All samples were properly stored and preserved except for a one VOC sample where the pH was >2 at the time of analysis. Analytical data were predominantly reported from an analysis within the project-specified hold time. Laboratory and field blank contamination was minimal and nonimpacting overall to sample data.

4.4 Appropriateness of Reporting Limits

This project was designed to allow risk-based decisions to be made based on the results of common USEPA-approved analytical methodologies. Detection limits achieved are the best possible based on sample variables.

4.5 Comparability

Comparability of the data was verified through the use of standard USEPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.

4.6 Completeness

All results are usable for project objectives. There are no results rejected for project use. The completeness objective of 90 percent was met. As previously stated, the sample and it's duplicate of pentachlorophenol that significantly exceeded hold time was re-collected, the re-collected data are acceptable and within the hold time. Project completeness data are summarized in Table 13.

4.7 Conclusions

The data generated from sample analyses are of sufficient quality and quantity necessary for accomplishing project objectives. Sample results accurately indicate the presence and/or absence of target analyte contamination at sampled locations. Samples were collected and analyzed as specified in the project QAPP.

5.0 References

CH2M. 2017. *Environmental remedial Investigation at the Iowa Army Ammunition Plant, Middletown, Iowa*.

U.S. Environmental Protection Agency (USEPA). 1997. *SW-846 Test Methods for Evaluating Solid Waste, Latest Update*. June

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMG	280-108850-1	JAW30-0418	SW8151A	4/20/2018	4/21/2018	4/30/2018	5/1/2018
		JAW31-0418	SW8151A	4/20/2018	4/21/2018	4/30/2018	5/1/2018
TAMC		JAW31-0418	SW8290	4/20/2018	4/21/2018	4/24/2018	5/1/2018
TAMG		LINE9-FD1	SW8151A	4/20/2018	4/21/2018	4/30/2018	5/1/2018
TAMQ	280-108898-1	CCLTTMW004-0418	SW8330B	4/23/2018	4/24/2018	4/28/2018	5/1/2018
		CCLTTMW004-0418	SW8330B	4/23/2018	4/24/2018	4/28/2018	5/10/2018
		CCLTTMW004-0418	SW8330B	4/23/2018	4/24/2018	5/3/2018	5/5/2018
		CCLTTMW004-0418	SW8330B	4/23/2018	4/24/2018	5/3/2018	5/11/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	4/26/2018	5/19/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/25/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/23/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/11/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	4/26/2018	5/2/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	4/26/2018	4/30/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	4/26/2018	4/28/2018
		CONTG-FD1	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/17/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	4/26/2018	4/28/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	4/26/2018	4/30/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	4/26/2018	5/2/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	4/26/2018	5/19/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/11/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/17/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/23/2018
		G15-0418	SW8330B	4/22/2018	4/24/2018	5/7/2018	5/25/2018
STL-SEA		JAW29-0418	SW8270-SIM	4/22/2018	4/24/2018	4/27/2018	5/21/2018
		L9MW1-0418	SW8270-SIM	4/21/2018	4/24/2018	4/27/2018	5/21/2018
		L9MW1-0418MS	SW8270-SIM	4/21/2018	4/24/2018	4/27/2018	5/24/2018
		L9MW1-0418SD	SW8270-SIM	4/21/2018	4/24/2018	4/27/2018	5/24/2018
		L9TTMW02-0418	SW8270-SIM	4/21/2018	4/24/2018	4/27/2018	5/21/2018
TAMC	280-108898-2	JAW29-0418	SW8290	4/22/2018	4/24/2018	7/9/2018	7/16/2018
		JAW29-0418	SW8290	4/22/2018	4/24/2018	7/9/2018	7/18/2018
		L9MW1-0418	SW8290	4/21/2018	4/24/2018	7/9/2018	7/16/2018
		L9MW1-0418	SW8290	4/21/2018	4/24/2018	7/9/2018	7/18/2018
		L9TTMW02-0418	SW8290	4/21/2018	4/24/2018	6/18/2018	7/3/2018
		L9TTMW02-0418	SW8290	4/21/2018	4/24/2018	6/18/2018	7/4/2018
TAMQ	280-108965-1	G47-0418	SW8330B	4/24/2018	4/25/2018	4/26/2018	5/2/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-108965-1	G47-0418	SW8330B	4/24/2018	4/25/2018	5/7/2018	5/11/2018
		G47-0418	SW8330B	4/24/2018	4/25/2018	4/26/2018	4/28/2018
		G47-0418	SW8330B	4/24/2018	4/25/2018	5/7/2018	5/17/2018
TAML	280-109029-1	CDL-EB1-0418	SW6020	4/25/2018	4/26/2018	5/3/2018	5/4/2018
		CDL-EB1-0418	SW7470A	4/25/2018	4/26/2018	5/4/2018	5/4/2018
		CDL-EB1-0418MS	SW7470A	4/25/2018	4/26/2018	5/4/2018	5/4/2018
		CDL-EB1-0418SD	SW7470A	4/25/2018	4/26/2018	5/4/2018	5/4/2018
TAMQ		CONTG-EB1-0418	SW8330B	4/25/2018	4/26/2018	5/2/2018	5/5/2018
		CONTG-EB1-0418	SW8330B	4/25/2018	4/26/2018	5/2/2018	5/10/2018
		CONTG-EB1-0418	SW8330B	4/25/2018	4/26/2018	5/14/2018	5/22/2018
		CONTG-EB1-0418	SW8330B	4/25/2018	4/26/2018	5/14/2018	5/25/2018
TAML		JAW09-0418	SW6020	4/25/2018	4/26/2018	5/3/2018	5/4/2018
		JAW09-0418	SW7470A	4/25/2018	4/26/2018	5/4/2018	5/4/2018
		JAW09-0418MS	SW6020	4/25/2018	4/26/2018	5/3/2018	5/4/2018
		JAW09-0418SD	SW6020	4/25/2018	4/26/2018	5/3/2018	5/4/2018
TAMG		LINE9-EB1-0418	SW8151A	4/25/2018	4/26/2018	4/30/2018	5/1/2018
TAMC		LINE9-EB1-0418	SW8290	4/25/2018	4/26/2018	5/15/2018	5/17/2018
		LINE9-EB1-0418	SW8290	4/25/2018	4/26/2018	5/15/2018	5/20/2018
	280-111315-1	5B-DP1-0618	SW8330B	6/21/2018	6/22/2018	6/27/2018	6/30/2018
		5B-DP2-0618	SW8330B	6/21/2018	6/22/2018	6/27/2018	6/30/2018
		EB01-0618	SW8330B	6/21/2018	6/22/2018	6/27/2018	6/30/2018
	280-112010-1	L3-DP1-2530-0718	SW8330B	7/13/2018	7/16/2018	7/19/2018	7/24/2018
TAML	280-113005-1	PDS-MW1-0818	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW1-0818	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW1-0818MS	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW1-0818MS	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW1-0818SD	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW1-0818SD	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW2-0818	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW2-0818	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW3-0818	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW3-0818	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
		PDS-MW4-0818	SW6020	8/6/2018	8/8/2018	8/22/2018	8/31/2018
		PDS-MW4-0818	SW7470A	8/6/2018	8/8/2018	8/15/2018	8/16/2018
TAMC	280-113558-1	L3A-MW3A-0818	SW8330B	8/22/2018	8/23/2018	8/29/2018	9/11/2018
TAMQ		L3AP-MW1-0818	SW8260B	8/22/2018	8/23/2018	9/5/2018	9/5/2018

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Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	280-113558-1	L3AP-MW1-0818	SW8330B	8/22/2018	8/23/2018	8/29/2018	9/11/2018
TAMQ		L3AP-MW1-0818MS	SW8260B	8/22/2018	8/23/2018	9/5/2018	9/5/2018
TAMC		L3AP-MW1-0818MS	SW8330B	8/22/2018	8/23/2018	8/29/2018	9/11/2018
TAMQ		L3AP-MW1-0818SD	SW8260B	8/22/2018	8/23/2018	9/5/2018	9/5/2018
TAMC		L3AP-MW1-0818SD	SW8330B	8/22/2018	8/23/2018	8/29/2018	9/11/2018
TAMQ		TB-2-082218	SW8260B	8/22/2018	8/23/2018	9/5/2018	9/5/2018
TAML	280-113889-1	CDL-JAW10-0818	SW6020	8/30/2018	9/1/2018	9/11/2018	9/18/2018
		CDL-JAW10-0818	SW7470A	8/30/2018	9/1/2018	9/10/2018	9/11/2018
		CDL-JAW10-0818MS	SW7470A	8/30/2018	9/1/2018	9/10/2018	9/11/2018
		CDL-JAW10-0818SD	SW7470A	8/30/2018	9/1/2018	9/10/2018	9/11/2018
		CDL-JAW8-0818	SW6020	8/30/2018	9/1/2018	9/11/2018	9/18/2018
		CDL-JAW8-0818	SW7470A	8/30/2018	9/1/2018	9/10/2018	9/11/2018
		CDL-JAW8-0818MS	SW6020	8/30/2018	9/1/2018	9/11/2018	9/18/2018
		CDL-JAW8-0818SD	SW6020	8/30/2018	9/1/2018	9/11/2018	9/18/2018
TAMQ	280-117127-1	TB-1118	SW8260B	11/16/2018	11/17/2018	11/28/2018	11/28/2018
	280-117127-2	L1-MW107-1118	SW8260B	11/16/2018	11/17/2018	11/28/2018	11/28/2018
		L1-MW107-EB-1118	SW8260B	11/16/2018	11/17/2018	11/28/2018	11/28/2018
	280-120959-1	EBP-MW15-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/18/2019
		EBP-MW15-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EBP-MW3-0319	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EBP-MW3-0319	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
		EBP-MW6-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EBP-MWF3-0319	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EBP-MWF3-0319	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EDA-2-0319	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EDA-2-0319	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/17/2019
		EDA-2-0319	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EDA-2-0319MS	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EDA-2-0319MS	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
TAML		EDA-2-0319SD	SW6020	3/6/2019	3/8/2019	3/14/2019	3/20/2019
TAMQ		EDA-2-0319SD	SW8330B	3/6/2019	3/8/2019	3/12/2019	3/21/2019
		JAW-07-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
	280-120959-2	WBP-TTMW-01-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
		WBP-TTMW-02-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/18/2019
		WBP-TTMW-02-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
TAML		WPB-99-5-0319	SW6020	3/7/2019	3/8/2019	3/14/2019	3/20/2019

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Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAML	280-120959-2	WPB-99-5-0319	SW7470A	3/7/2019	3/8/2019	3/15/2019	3/15/2019
TAMQ		WPB-99-5-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/18/2019
		WPB-99-5-0319	SW8330B	3/7/2019	3/8/2019	3/12/2019	3/21/2019
TAML		WPB-99-5-0319MS	SW7470A	3/7/2019	3/8/2019	3/15/2019	3/15/2019
		WPB-99-5-0319SD	SW7470A	3/7/2019	3/8/2019	3/15/2019	3/15/2019
TAMQ	280-121028-1	FTP-MW1-0319	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/21/2019
		FTP-MW2-0319	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/21/2019
	280-121028-2	TB-01-030719	SW8260B	3/7/2019	3/9/2019	3/16/2019	3/16/2019
		WBP-TTMW-01-0319	SW8260B	3/7/2019	3/9/2019	3/16/2019	3/16/2019
		WBP-TTMW-01-0319	SW8260B	3/7/2019	3/9/2019	3/18/2019	3/18/2019
		WBP-TTMW-02-0319	SW8260B	3/7/2019	3/9/2019	3/16/2019	3/16/2019
		WBP-TTMW-02-0319	SW8260B	3/7/2019	3/9/2019	3/18/2019	3/18/2019
TAML	280-121028-3	EB-EBP-01-030819	SW6020	3/8/2019	3/9/2019	3/14/2019	3/20/2019
TAMQ		EB-EBP-01-030819	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/18/2019
		EB-EBP-01-030819	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/21/2019
		EBP-MW16-0319	SW8330B	3/7/2019	3/9/2019	3/12/2019	3/21/2019
TAML		EBP-MW2-0319	SW6020	3/7/2019	3/9/2019	3/14/2019	3/20/2019
TAMQ		EBP-MW2-0319	SW8330B	3/7/2019	3/9/2019	3/12/2019	3/21/2019
		EBP-MW7-0319	SW8330B	3/7/2019	3/9/2019	3/12/2019	3/21/2019
		EDA-1-0319	SW8330B	3/8/2019	3/9/2019	3/12/2019	3/21/2019
	280-121068-1	EBP-MW13-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/18/2019
		EBP-MW13-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/21/2019
TAML		EBP-MW9-0319	SW6020	3/8/2019	3/12/2019	3/18/2019	3/26/2019
TAMQ		EBP-MW9-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/18/2019
		EBP-MW9-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/21/2019
TAML		FJAW-80-0319	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		FJAW-80-0319	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		FJAW-80-0319	SW8260B	3/9/2019	3/12/2019	3/22/2019	3/22/2019
		FJAW-80-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
		FTP-MW3-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/21/2019
		FTP-MW7-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		FTP-MW8-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		G-30-0319	SW8330B	3/8/2019	3/12/2019	3/15/2019	3/21/2019
TAML		JAW-58-0319	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-58-0319	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-58-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019

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Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAML	280-121068-1	JAW-59-0319	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-59-0319	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-59-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		JAW-59-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/18/2019
		JAW-59-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
TAML		JAW-80-0319	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-80-0319	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-80-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		JAW-80-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
TAML		JAW-80-0319MS	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-80-0319MS	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-80-0319MS	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		JAW-80-0319MS	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
TAML		JAW-80-0319SD	SW6020	3/9/2019	3/12/2019	3/18/2019	3/26/2019
		JAW-80-0319SD	SW7470A	3/9/2019	3/12/2019	3/21/2019	3/21/2019
TAMQ		JAW-80-0319SD	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		JAW-80-0319SD	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
		TB-02-030819	SW8260B	3/8/2019	3/12/2019	3/20/2019	3/20/2019
		WBP-99-1-0319	SW8260B	3/9/2019	3/12/2019	3/21/2019	3/21/2019
		WBP-99-1-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
		WBP-99-1-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/18/2019
		WBP-TTMW-15-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/18/2019
		WBP-TTMW-15-0319	SW8330B	3/9/2019	3/12/2019	3/15/2019	3/21/2019
TAML	280-121140-1	EB-LCBK-01-031219	SW6020	3/12/2019	3/15/2019	3/20/2019	4/2/2019
		EB-LCBK-01-031219	SW6020	3/12/2019	3/15/2019	4/2/2019	4/3/2019
		EB-LCBK-01-031219	SW7470A	3/12/2019	3/15/2019	3/21/2019	3/22/2019
		EB-LCBK-01-031219	SW7470A	3/12/2019	3/15/2019	3/26/2019	3/27/2019
TAMQ	280-121155-1	EB-WBP-01-031219	SW8260B	3/12/2019	3/15/2019	3/22/2019	3/22/2019
		EB-WBP-01-031219	SW8330B	3/12/2019	3/15/2019	3/28/2019	3/29/2019
		EB-WBP-01-031219	SW8330B	3/12/2019	3/15/2019	3/28/2019	3/31/2019
		EB-WBP-01-031219	SW8330B	3/12/2019	3/15/2019	3/18/2019	3/22/2019
		EB-WBP-01-031219	SW8330B	3/12/2019	3/15/2019	3/18/2019	3/23/2019
		EDA-SW01-0319	SW8260B	3/12/2019	3/15/2019	3/22/2019	3/22/2019
		EDA-SW01-0319	SW8330B	3/12/2019	3/15/2019	3/18/2019	3/23/2019
		EDA-SW01-0319	SW8330B	3/12/2019	3/15/2019	3/28/2019	3/29/2019
TAML		EDA-SW02-0319	SW6020	3/12/2019	3/15/2019	3/20/2019	4/2/2019

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Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAML	280-121155-1	EDA-SW02-0319	SW6020	3/12/2019	3/15/2019	4/2/2019	4/4/2019
		EDA-SW02-0319	SW7470A	3/12/2019	3/15/2019	3/21/2019	3/22/2019
		EDA-SW02-0319	SW7470A	3/12/2019	3/15/2019	3/26/2019	3/27/2019
TAMQ		EDA-SW02-0319	SW8260B	3/12/2019	3/15/2019	3/22/2019	3/22/2019
		EDA-SW02-0319	SW8330B	3/12/2019	3/15/2019	3/18/2019	3/23/2019
		EDA-SW02-0319	SW8330B	3/12/2019	3/15/2019	3/28/2019	3/29/2019
		TB-03-031219	SW8260B	3/12/2019	3/15/2019	3/22/2019	3/22/2019
TAML	280-121391-1	EDA-SW04-0319	SW6020	3/19/2019	3/20/2019	3/22/2019	4/9/2019
		EDA-SW04-0319	SW6020	3/19/2019	3/20/2019	4/2/2019	4/3/2019
		EDA-SW04-0319	SW7470A	3/19/2019	3/20/2019	3/26/2019	3/27/2019
TAMQ		EDA-SW04-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
TAML		EDA-SW04-0319MS	SW6020	3/19/2019	3/20/2019	3/22/2019	4/9/2019
		EDA-SW04-0319SD	SW6020	3/19/2019	3/20/2019	3/22/2019	4/9/2019
TAMQ	280-121393-1	OU3-FSW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
		OU3-FSW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/1/2019
		OU3-FSW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/2/2019
		OU3-SW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
		OU3-SW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/1/2019
		OU3-SW01-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/2/2019
		OU3-SW02-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/2/2019
		OU3-SW02-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/1/2019
		OU3-SW02-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
		OU3-SW03-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	4/2/2019
		OU3-SW03-0319	SW8330B	3/19/2019	3/20/2019	3/26/2019	3/30/2019
	280-121485-1	EDA-SW03-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		EDA-SW04-0319	SW8260B	3/19/2019	3/21/2019	3/28/2019	3/28/2019
		FTA-99-1-0319	SW8260B	3/19/2019	3/21/2019	3/28/2019	3/28/2019
		FTA-99-1-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		FTA-99-1-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/3/2019
		JAW-25-0319	SW8260B	3/19/2019	3/21/2019	3/28/2019	3/28/2019
		JAW-25-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/2/2019
		JAW-25-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		JAW-25-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/1/2019
		OU3-SW04-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		OU3-SW04-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/3/2019
		TB-03-031919	SW8260B	3/19/2019	3/21/2019	3/28/2019	3/28/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121485-1	WBP-99-2-0319	SW8260B	3/19/2019	3/21/2019	3/29/2019	3/29/2019
		WBP-99-2-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		WBP-99-2-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/1/2019
		WBP-99-2-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/2/2019
		WBP-TTMW-12-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		WBP-TTMW-12-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/1/2019
		WBP-TTMW-12-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/2/2019
		WBP-TTMW-13-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		WBP-TTMW-14-0319	SW8260B	3/19/2019	3/21/2019	3/29/2019	3/29/2019
		WBP-TTMW-14-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	3/30/2019
		WBP-TTMW-14-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/2/2019
		WBP-TTMW-14-0319	SW8330B	3/19/2019	3/21/2019	3/26/2019	4/1/2019
TAML	280-121569-1	FTA-TT-MW-02-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		FTA-TT-MW-02-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
		FTP-MW4-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		FTP-MW4-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		FTP-MW4-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
		FTP-MW4-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/11/2019
TAML		FTP-MW4-0319MS	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		FTP-MW4-0319MS	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		FTP-MW4-0319MS	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/8/2019
		FTP-MW4-0319MS	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
TAML		FTP-MW4-0319SD	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		FTP-MW4-0319SD	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		FTP-MW4-0319SD	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
		FTP-MW4-0319SD	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/8/2019
TAML		JAW-60-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		JAW-60-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
		JAW-62-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		JAW-62-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
		JAW-63-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		JAW-63-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		JAW-63-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
TAML		SA-99-1-0319	SW6020	3/21/2019	3/22/2019	3/27/2019	4/10/2019
		SA-99-1-0319	SW7470A	3/21/2019	3/22/2019	3/29/2019	3/29/2019
TAMQ		SA-99-1-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/12/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121569-1	SA-99-1-0319	SW8330B	3/21/2019	3/22/2019	3/26/2019	4/6/2019
TAML	280-121620-1	EB-FTA-01-032119	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		EB-FTA-01-032119	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		EB-FTA-01-032119	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		EB-FTA-01-032119	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/29/2019
		FTA-99-2-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTA-99-2-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/29/2019
		FTA-TT-MW-02-0319	SW8260B	3/21/2019	3/23/2019	4/3/2019	4/3/2019
TAML		FTA-TT-MW-03-0319	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		FTA-TT-MW-03-0319	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		FTA-TT-MW-03-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
TAML		FTA-TT-MW-04-0319	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		FTA-TT-MW-04-0319	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		FTA-TT-MW-04-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTA-TT-MW-04-0319	SW8260B	3/21/2019	3/23/2019	4/1/2019	4/1/2019
TAML		FTA-TT-MW-05-0319	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		FTA-TT-MW-05-0319	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		FTA-TT-MW-05-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTA-TT-MW-05-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/29/2019
		FTA-TT-MW-05-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/31/2019
TAML		FTA-TT-MW-F05-0319	SW6020	3/21/2019	3/23/2019	3/27/2019	4/10/2019
		FTA-TT-MW-F05-0319	SW7470A	3/21/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		FTA-TT-MW-F05-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTA-TT-MW-F05-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/29/2019
		FTA-TT-MW-F05-0319	SW8330B	3/21/2019	3/23/2019	3/28/2019	3/31/2019
		FTP-MW4-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTP-MW4-0319MS	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		FTP-MW4-0319SD	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
TAML		JAW-23-0319	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		JAW-23-0319	SW7470A	3/22/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		JAW-23-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-23-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/30/2019
		JAW-23-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/31/2019
		JAW-23-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	4/2/2019
TAML		JAW-24-0319	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		JAW-24-0319	SW7470A	3/22/2019	3/23/2019	3/29/2019	3/29/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121620-1	JAW-24-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-24-0319	SW8260B	3/22/2019	3/23/2019	4/1/2019	4/1/2019
		JAW-24-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
		JAW-24-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	4/2/2019
		JAW-60-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-60-0319	SW8260B	3/21/2019	3/23/2019	4/1/2019	4/1/2019
		JAW-61-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-62-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		JAW-63-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		SA-99-1-0319	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
		TB-FTA-032119	SW8260B	3/21/2019	3/23/2019	3/31/2019	3/31/2019
TAML		WBP-MW2-0319	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		WBP-MW2-0319	SW7470A	3/22/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		WBP-MW2-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		WBP-MW2-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	4/2/2019
		WBP-MW2-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
TAML		WBP-MW2-0319MS	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		WBP-MW2-0319SD	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		WBP-TTMW-03-0319	SW6020	3/22/2019	3/23/2019	3/27/2019	4/10/2019
		WBP-TTMW-03-0319	SW7470A	3/22/2019	3/23/2019	3/29/2019	3/29/2019
TAMQ		WBP-TTMW-03-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		WBP-TTMW-03-0319	SW8260B	3/22/2019	3/23/2019	4/3/2019	4/3/2019
		WBP-TTMW-03-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
		WBP-TTMW-03-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/31/2019
		WBP-TTMW-03-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	4/2/2019
		WBP-TTMW-04-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		WBP-TTMW-04-0319	SW8260B	3/22/2019	3/23/2019	4/1/2019	4/1/2019
		WBP-TTMW-04-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/31/2019
		WBP-TTMW-04-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
		WBP-TTMW-08-0319	SW8260B	3/22/2019	3/23/2019	3/31/2019	3/31/2019
		WBP-TTMW-08-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/29/2019
		WBP-TTMW-08-0319	SW8330B	3/22/2019	3/23/2019	3/28/2019	3/31/2019
	280-121664-1	CDL-SD6-0319	SW8082	3/25/2019	3/26/2019	3/30/2019	4/10/2019
		CDL-SD7-0319	SW8082	3/25/2019	3/26/2019	3/30/2019	4/11/2019
		CDL-SD8-0319	SW8082	3/25/2019	3/26/2019	3/30/2019	4/11/2019
		CDL-SD8-0319MS	SW8082	3/25/2019	3/26/2019	3/30/2019	4/11/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121664-1	CDL-SD8-0319SD	SW8082	3/25/2019	3/26/2019	3/30/2019	4/11/2019
		CDL-SDF7-0319	SW8082	3/25/2019	3/26/2019	3/30/2019	4/10/2019
TAML		FTA-TT-MW-01-0319	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		FTA-TT-MW-01-0319	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		FTA-TT-MW-01-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
TAML		FTA-TT-MW-01-0319MS	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		FTA-TT-MW-01-0319MS	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
		FTA-TT-MW-01-0319SD	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		FTA-TT-MW-01-0319SD	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		FTP-MW1-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW2-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW3-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW5-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW6-R0319	SW8260B	3/24/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW6-R0319MS	SW8260B	3/24/2019	3/26/2019	4/2/2019	4/2/2019
		FTP-MW6-R0319SD	SW8260B	3/24/2019	3/26/2019	4/2/2019	4/2/2019
		G-30-R0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		JAW-11-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/31/2019
		JAW-11-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-11-0319MS	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-11-0319SD	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-12-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-13-0319	SW8260B	3/24/2019	3/26/2019	4/2/2019	4/2/2019
		JAW-13-0319	SW8260B	3/24/2019	3/26/2019	4/3/2019	4/3/2019
		JAW-13-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		JAW-14-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	4/2/2019
		JAW-14-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		L1-MW103-0319	SW8330B	3/25/2019	3/26/2019	4/2/2019	4/13/2019
		L1-MW103-0319	SW8330B	3/25/2019	3/26/2019	4/2/2019	4/11/2019
		L1-MW103-0319	SW8330B	3/25/2019	3/26/2019	3/28/2019	4/11/2019
		L1-MW103-0319	SW8330B	3/25/2019	3/26/2019	3/28/2019	3/31/2019
		M-01-0319	SW8260B	3/24/2019	3/26/2019	4/3/2019	4/3/2019
		NBP-MW1-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	3/30/2019
		NBP-MW1-0319	SW8330B	3/24/2019	3/26/2019	3/28/2019	4/2/2019
		TB-WBP-0322219	SW8260B	3/22/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-99-4-0319	SW8330B	3/22/2019	3/26/2019	3/29/2019	4/5/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121664-1	WBP-99-4-0319	SW8330B	3/22/2019	3/26/2019	3/29/2019	4/11/2019
		WBP-99-5-R0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-99-5-R0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-99-6-0319	SW8260B	3/22/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-99-6-0319	SW8260B	3/22/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-99-6-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-99-6-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-99-6-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-99-6-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/10/2019
TAML		WBP-MW1-0319	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		WBP-MW1-0319	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		WBP-MW1-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-MW1-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-MW1-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-MW1-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-MW1-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-MW3-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-MW3-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-MW3-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-MW3-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-MW3-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-MW3-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-MW8-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-MW8-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/2/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-MW8-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/12/2019
TAML		WBP-MW9-0319	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		WBP-MW9-0319	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		WBP-MW9-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-MW9-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-MW9-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-MW9-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-MW9-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121664-1	WBP-MW9-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-05B-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-05B-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-05B-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-05B-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
TAML		WBP-TTMW-06-0319	SW6020	3/23/2019	3/26/2019	4/2/2019	4/4/2019
		WBP-TTMW-06-0319	SW7470A	3/23/2019	3/26/2019	4/1/2019	4/2/2019
TAMQ		WBP-TTMW-06-0319	SW8260B	3/24/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/2/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/12/2019
		WBP-TTMW-06-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-10-0319	SW8260B	3/23/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-TTMW-10-0319	SW8260B	3/23/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-10-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-TTMW-10-0319	SW8330B	3/23/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-10-0319	SW8330B	3/23/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-11-0319	SW8260B	3/22/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-11-0319	SW8260B	3/22/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/2/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/11/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/12/2019
		WBP-TTMW-11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/13/2019
		WBP-TTMW-F11-0319	SW8260B	3/22/2019	3/26/2019	4/2/2019	4/2/2019
		WBP-TTMW-F11-0319	SW8260B	3/22/2019	3/26/2019	4/3/2019	4/3/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/2/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/12/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	3/31/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	3/28/2019	4/10/2019
		WBP-TTMW-F11-0319	SW8330B	3/22/2019	3/26/2019	4/2/2019	4/11/2019
	280-121734-1	EBP-MW13-R0319	SW8260B	3/25/2019	3/27/2019	4/3/2019	4/3/2019
		EBP-MW17-0319	SW8330B	3/25/2019	3/27/2019	3/28/2019	3/31/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-121734-1	EBP-MW17-0319	SW8330B	3/25/2019	3/27/2019	4/2/2019	4/12/2019
		NBPLF-MW3-0319	SW8330B	3/25/2019	3/27/2019	3/28/2019	3/31/2019
		NBPLF-MW3-0319	SW8330B	3/25/2019	3/27/2019	3/28/2019	4/4/2019
		NBPLF-MW3-0319	SW8330B	3/25/2019	3/27/2019	4/2/2019	4/12/2019
		NBPLF-MW3-0319	SW8330B	3/25/2019	3/27/2019	4/2/2019	4/13/2019
		TB-EBP-032519	SW8260B	3/25/2019	3/27/2019	4/3/2019	4/3/2019
	280-123239-1	L3AP-TW19-01-3545-0419	SW8260B	4/29/2019	5/1/2019	5/9/2019	5/9/2019
		L3AP-TW19-01-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/20/2019
		L3AP-TW19-01-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/10/2019
		L3AP-TW19-01-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/17/2019
		L3AP-TW19-02-3545-0419	SW8260B	4/29/2019	5/1/2019	5/9/2019	5/9/2019
		L3AP-TW19-02-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/10/2019
		L3AP-TW19-02-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/14/2019
		L3AP-TW19-02-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/17/2019
		L3AP-TW19-02-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/20/2019
		L3AP-TW19-03-3545-0419	SW8260B	4/29/2019	5/1/2019	5/9/2019	5/9/2019
		L3AP-TW19-03-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/20/2019
		L3AP-TW19-03-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/10/2019
		L3AP-TW19-03-3545-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/14/2019
		L3AP-TW19-03-3545-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/17/2019
		TB-042919	SW8260B	4/29/2019	5/1/2019	5/9/2019	5/9/2019
	280-123244-1	L3A-TW19-01-1020-0419	SW8330B	4/28/2019	5/1/2019	5/3/2019	5/10/2019
		L3A-TW19-01-1020-0419	SW8330B	4/28/2019	5/1/2019	5/3/2019	5/14/2019
		L3A-TW19-01-1020-0419	SW8330B	4/28/2019	5/1/2019	5/11/2019	5/16/2019
		L3A-TW19-01-1020-0419	SW8330B	4/28/2019	5/1/2019	5/11/2019	5/21/2019
		L3A-TW19-02-1020-0419	SW8330B	4/27/2019	5/1/2019	5/3/2019	5/10/2019
		L3A-TW19-02-1020-0419	SW8330B	4/27/2019	5/1/2019	5/3/2019	5/14/2019
		L3A-TW19-02-1020-0419	SW8330B	4/27/2019	5/1/2019	5/11/2019	5/16/2019
		L3A-TW19-02-1020-0419	SW8330B	4/27/2019	5/1/2019	5/11/2019	5/21/2019
		L3A-TW19-03-1020-0419	SW8330B	4/27/2019	5/1/2019	5/11/2019	5/16/2019
		L3A-TW19-03-1020-0419	SW8330B	4/27/2019	5/1/2019	5/11/2019	5/21/2019
		L3A-TW19-03-1020-0419	SW8330B	4/27/2019	5/1/2019	5/3/2019	5/14/2019
		L3A-TW19-03-1020-0419	SW8330B	4/27/2019	5/1/2019	5/3/2019	5/10/2019
		L3A-TW19-04B-5060-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/14/2019
		L3A-TW19-04B-5060-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/17/2019
		L3A-TW19-04B-5060-0419	SW8330B	4/29/2019	5/1/2019	5/11/2019	5/21/2019

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMQ	280-123244-1	L3A-TW19-04B-5060-0419	SW8330B	4/29/2019	5/1/2019	5/4/2019	5/10/2019
	280-126174-1	L3A-TW19-04A-1525-0719	SW8330B	7/11/2019	7/12/2019	7/16/2019	7/17/2019
		L3A-TW19-04A-1525-0719	SW8330B	7/11/2019	7/12/2019	7/16/2019	7/18/2019
TAMC	320-39972-1	EB01-0518	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		G-40-0518	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		G-40-0518MS	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		G-40-0518SD	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		L2-MW8-0518	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
		L2-MWF8-0518	SW8330B	5/31/2018	6/2/2018	6/6/2018	6/16/2018
	320-40651-1	CTATW001-0618	SW8330B	6/23/2018	6/26/2018	6/27/2018	6/30/2018
		CTATW002-0618	SW8330B	6/23/2018	6/26/2018	6/27/2018	6/30/2018
		CTATW003-0618	SW8330B	6/23/2018	6/26/2018	6/27/2018	6/30/2018
		CW-P-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/29/2018
		EDA-4-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/30/2018
		EDA-4-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	7/2/2018
		JAW-626-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/30/2018
		JAW-627-0618	SW8330B	6/25/2018	6/26/2018	6/27/2018	6/29/2018
		JAW-627-0618	SW8330B	6/25/2018	6/26/2018	6/27/2018	7/2/2018
		L2-MW11-0618	SW8330B	6/25/2018	6/26/2018	6/27/2018	6/29/2018
		NBPLF-MW1-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/29/2018
		NBPLF-MW5-0618	SW8330B	6/24/2018	6/26/2018	6/27/2018	6/29/2018
	320-41113-1	EBP-MW4-0718	SW8330B	7/12/2018	7/13/2018	7/19/2018	7/24/2018
		EBP-MW4-0718	SW8330B	7/12/2018	7/13/2018	7/19/2018	7/25/2018
		EBP-MW5-0718	SW8330B	7/12/2018	7/13/2018	7/19/2018	7/24/2018
		EBP-MW5-0718	SW8330B	7/12/2018	7/13/2018	7/19/2018	7/25/2018
	320-41393-1	5A-MW1-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		5A-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		5A-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/11/2018
		5A-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/14/2018
		5A-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/17/2018
		5A-MW5-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/11/2018
		5A-MW5-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/17/2018
		5A-MWF5-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/18/2018
		5A-MWF5-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/11/2018
		5B-MW1-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		5B-MW2-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-41393-1	5B-MW4-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/11/2018
		5B-MW4-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/20/2018
		JAW-606-0718	SW8330B	7/22/2018	7/24/2018	7/26/2018	8/14/2018
		JAW-607-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		JAW-608-0718	SW8330B	7/23/2018	7/24/2018	7/27/2018	8/10/2018
		JAW-608-0718	SW8330B	7/23/2018	7/24/2018	8/13/2018	8/19/2018
	320-41441-1	5A-MW3-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		5A-MW3-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/19/2018
		5B-MW3-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		5B-MW3-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/17/2018
		5B-MW3-0718MS	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/17/2018
		5B-MW3-0718MS	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		5B-MW3-0718SD	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/17/2018
		5B-MW3-0718SD	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		JAW-609-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/18/2018
		JAW-609-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/19/2018
		JAW-609F-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/19/2018
		JAW-609F-0718	SW8330B	7/24/2018	7/25/2018	7/31/2018	8/20/2018
	320-41445-1	5A-MW4-0718	SW8330B	7/20/2018	7/25/2018	7/26/2018	8/11/2018
		5A-MW6-0718	SW8330B	7/20/2018	7/25/2018	7/26/2018	8/11/2018
		L3-DP2-1520-0718	SW8330B	7/20/2018	7/25/2018	7/26/2018	8/11/2018
		L3-DP3-3438-0718	SW8330B	7/20/2018	7/25/2018	7/26/2018	8/11/2018
	320-41892-1	PDS-MW1-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/13/2018
		PDS-MW1-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
		PDS-MW1-0818MS	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW1-0818MS	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
		PDS-MW1-0818SD	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW1-0818SD	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
		PDS-MW2-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW3-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW3-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
		PDS-MW4-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/14/2018
		PDS-MW4-0818	SW8330B	8/6/2018	8/8/2018	8/9/2018	8/18/2018
	320-42259-1	JAW-15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/29/2018
		JAW-15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/24/2018

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Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42259-1	JAW-15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/30/2018
		JAW-16-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-16-0818MS	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-16-0818SD	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-17-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-17-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-17-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/29/2018
		JAW-17-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/31/2018
		JAW-19-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-19-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-20-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-20-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-21-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-21-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-22-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-22-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-22-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/29/2018
		JAW-22-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/30/2018
		JAW-F15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/24/2018
		JAW-F15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/26/2018
		JAW-F15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/29/2018
		JAW-F15-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/30/2018
		L3A-EB1-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/26/2018
		L3A-EB1-0818	SW8330B	8/16/2018	8/18/2018	8/21/2018	8/24/2018
TAMQ		L3AP-MW3-0818	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-MW3-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/26/2018
		L3AP-MW3-0818	SW8330B	8/17/2018	8/18/2018	8/21/2018	8/24/2018
TAMQ		TB-2-081718	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
	320-42263-1	L3AP-EB1-0818	SW8260B	8/16/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-EB1-0818	SW8330B	8/16/2018	8/18/2018	8/22/2018	8/31/2018
TAMQ		L3AP-FMW4-0818	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-FMW4-0818	SW8330B	8/17/2018	8/18/2018	8/22/2018	8/31/2018
TAMQ		L3AP-MW2-0818	SW8260B	8/16/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-MW2-0818	SW8330B	8/16/2018	8/18/2018	8/22/2018	8/31/2018
TAMQ		L3AP-MW4-0818	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
TAMC		L3AP-MW4-0818	SW8330B	8/17/2018	8/18/2018	8/22/2018	8/31/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42263-1	L3AP-MW4-0818	SW8330B	8/17/2018	8/18/2018	8/22/2018	8/30/2018
TAMQ		TB-1-081718	SW8260B	8/17/2018	8/18/2018	8/30/2018	8/30/2018
TAMC	320-42328-1	L800-FMW12-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-FMW12-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-G17-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/5/2018
		L800-G17-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-G17-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/7/2018
		L800-MW1-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW1-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/31/2018
		L800-MW1-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW12-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW12-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW13-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW13-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/5/2018
		L800-MW15-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW18-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW18-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW25-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW25-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/31/2018
		L800-MW25-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW26-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW4-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW4-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/7/2018
		L800-MW7-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/5/2018
		L800-MW7-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW8-0818	SW8330B	8/19/2018	8/21/2018	8/24/2018	9/6/2018
		L800-MW9-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW9-0818	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW9-0818MS	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW9-0818MS	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
		L800-MW9-0818SD	SW8330B	8/18/2018	8/21/2018	8/23/2018	8/30/2018
		L800-MW9-0818SD	SW8330B	8/18/2018	8/21/2018	8/23/2018	9/1/2018
	320-42437-1	L3A-MW1A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/12/2018
		L3A-MW1A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/13/2018
		L3A-MW1B-0818	SW8330B	8/21/2018	8/23/2018	8/28/2018	9/12/2018
		L3A-MW4A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/12/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42437-1	L3A-MW4A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/13/2018
		L3A-MW4B-0818	SW8330B	8/21/2018	8/23/2018	8/28/2018	9/12/2018
		L3A-MW4B-0818	SW8330B	8/21/2018	8/23/2018	8/28/2018	9/13/2018
		L3A-MW5A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/13/2018
		L3A-MW5A-0818	SW8330B	8/22/2018	8/23/2018	8/28/2018	9/12/2018
	320-42445-1	L3A-MW3B-0818	SW8330B	8/22/2018	8/23/2018	8/27/2018	9/12/2018
		L3A-MW5B-0818	SW8330B	8/22/2018	8/23/2018	8/27/2018	9/13/2018
		L3A-MW5B-0818	SW8330B	8/22/2018	8/23/2018	8/27/2018	9/12/2018
		L800-G56-0818	SW8330B	8/20/2018	8/23/2018	8/27/2018	9/12/2018
		L800-MW14-0818	SW8330B	8/20/2018	8/23/2018	8/27/2018	9/12/2018
	320-42600-1	L800-MW29-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/13/2018
		L800-MW29-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/14/2018
		L800-MW29-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/4/2018
		L800-MW30-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/14/2018
		L800-MW30-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/15/2018
		L800-MW30-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/4/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/7/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/22/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/17/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/13/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/4/2018
		L800-MW31-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/14/2018
		L800-MWF30-0818	SW8330B	8/28/2018	8/29/2018	8/31/2018	9/14/2018
		L800-MWF30-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/4/2018
		L800-MWF30-0818	SW8330B	8/28/2018	8/29/2018	9/17/2018	10/7/2018
	320-42602-1	JAW70-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	9/21/2018
		JAW70-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/3/2018
		JAW70-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/13/2018
		L2-MW4-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/3/2018
		L2-MW4-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	9/21/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/14/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/13/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/4/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/3/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/1/2018
		L800-G20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/2/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42602-1	L800-MW20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	9/21/2018
		L800-MW20-0818	SW8330B	8/28/2018	8/29/2018	9/4/2018	10/3/2018
	320-42611-1	G-45-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/7/2018
		L800-G-58-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/10/2018
		L800-G-58-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/8/2018
		L800-G-58-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/7/2018
		L800-G-58-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/11/2018
		L800-MW28-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/7/2018
		L800-MW28-0818	SW8330B	8/27/2018	8/29/2018	8/30/2018	9/8/2018
	320-42636-1	JAW-71-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	9/22/2018
		JAW-71-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/4/2018
		L2-A-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	9/22/2018
		L2-A-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/4/2018
		L2-MW9-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	9/22/2018
		L2-MW9-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/4/2018
	320-42639-1	L800-TTMW09-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/2/2018
		L800-TTMW09-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/4/2018
		L800-TTMW09-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/1/2018
		L800-TTMW09-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/6/2018
		L800-TTMW15-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	9/22/2018
		L800-TTMW15-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/2/2018
		L800-TTMW15-0818	SW8330B	8/28/2018	8/30/2018	9/4/2018	10/3/2018
	320-42660-1	L800-G-43-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-MW27-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-MW27-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-MW27-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	10/2/2018
		L800-MW27-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	10/20/2018
	320-42664-1	L800-TTMW18-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-TTMW18-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-TTMW18-0818MMS	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-TTMW18-0818MMS	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-TTMW18-0818MSD	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-TTMW18-0818MSD	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
	320-42666-1	CCL-TTMW002-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		CCL-TTMW002-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		JAW-73-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42666-1	JAW-73-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
	320-42670-1	L800-TTMW01-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
		L800-TTMW04-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/22/2018
		L800-TTMW04-0818	SW8330B	8/29/2018	8/30/2018	9/5/2018	9/29/2018
	320-42724-1	L3A-EB-083018	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		L3A-EB-083018	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		L3A-MW7-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
	320-42726-1	CCL-TTMW003-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		CCL-TTMW003-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		CCL-TTMW009-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		CCL-TTMW009-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
		L2-12-C-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		L2-12-C-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
		L2-JAW-74-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/22/2018
		L2-JAW-74-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
	320-42727-1	L2-12-F-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		L2-12-F-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
		L2-MW3-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
	320-42729-1	CCL-TTMW001-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		CCL-TTMW001-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		CCL-TTMW006-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		CCL-TTMW006-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		CCL-TTMW022-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/29/2018
	320-42730-1	L3A-JAW-18-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/2/2018
		L3A-JAW-18-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/7/2018
		L3A-JAW-18-0818	SW8330B	8/30/2018	8/31/2018	9/6/2018	10/30/2018
		L3A-MW6A-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		L3A-MW6A-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/30/2018
		L3A-MW6B-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/23/2018
		L3A-MW6B-0818	SW8330B	8/29/2018	8/31/2018	9/5/2018	9/30/2018
	320-42739-1	L2-JAW-75-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/2/2018
		L2-JAW-75-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/7/2018
		L2-MW10-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/7/2018
		L2-MW10-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/2/2018
		L2-MW1-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/2/2018
		L2-MW1-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/7/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-42739-1	L2-TTMW02-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/2/2018
		L2-TTMW02-0818	SW8330B	8/30/2018	9/1/2018	9/6/2018	10/7/2018
	320-45351-1	G-14-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		G-14-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		GZ-3-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		GZ-3-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		JAW-40-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-40-1118	SW8330B	11/15/2018	11/16/2018	2/7/2019	2/8/2019
		JAW42-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/2/2018
		JAW42-1118	SW8330B	11/15/2018	11/16/2018	12/11/2018	12/24/2018
		JAW-47-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-47-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/22/2019
		JAW-47-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		JAW-52-1118	SW8330B	11/14/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-52-1118	SW8330B	11/14/2018	11/16/2018	12/27/2018	1/21/2019
		JAW-52-1118	SW8330B	11/14/2018	11/16/2018	12/27/2018	1/23/2019
		JAW-52-1118MS	SW8330B	11/14/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-52-1118SD	SW8330B	11/14/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-52-EB-1118	SW8330B	11/14/2018	11/16/2018	11/20/2018	12/20/2018
		JAW-52-EB-1118	SW8330B	11/14/2018	11/16/2018	12/27/2018	1/21/2019
		JAW-52-EB-1118	SW8330B	11/14/2018	11/16/2018	12/27/2018	1/23/2019
		L1-MW102-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-MW102-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-MW102-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/22/2019
		L1-MW102-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-MW104-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-MW104-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-MW104-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-MW-105-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-MW-105-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-MW106-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/21/2019
		L1-MW106-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-MW106-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-MW106-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-TTMW-100-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-TTMW-100-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMC	320-45351-1	L1-TTMW-100-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/22/2019
		L1-TTMW-100-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
		L1-TTMW-101-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/20/2018
		L1-TTMW-101-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/22/2019
		L1-TTMW-101-1118	SW8330B	11/15/2018	11/16/2018	11/20/2018	12/9/2018
		L1-TTMW-101-1118	SW8330B	11/15/2018	11/16/2018	12/27/2018	1/24/2019
	320-45381-1	GZ-2-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/24/2019
		GZ-2-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/22/2018
		GZ-2-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/23/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/26/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/28/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/27/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/24/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/23/2019
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/14/2018
		GZ-2A-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/22/2018
		JAW-41-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/14/2018
		JAW-41-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/22/2018
		JAW-41-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/23/2019
		JAW-41-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/24/2019
		LI-MW107-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/22/2018
		LI-MW107-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/23/2019
		LI-MW107-1118	SW8330B	11/16/2018	11/17/2018	12/27/2018	1/24/2019
		LI-MW107-1118	SW8330B	11/16/2018	11/17/2018	11/23/2018	12/14/2018
LANC	WYC04	L3AP-EB1-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-FMW4-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW1-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW1-0818MS	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW1-0818SD	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW2-0818	E218.6	8/21/2018	8/27/2018		9/4/2018
		L3AP-MW3-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
		L3AP-MW4-0818	E218.6	8/22/2018	8/27/2018		9/4/2018
	WYC05	CCL-TTMW002-0818	E218.6	8/29/2018	8/30/2018		9/5/2018
	WYC06	CCL-TTMW001-0818	E218.6	8/30/2018	8/31/2018		9/5/2018
		CCL-TTMW003-0818	E218.6	8/30/2018	8/31/2018		9/5/2018
		CCL-TTMW004-0818	E218.6	8/30/2018	8/31/2018		9/6/2018

TABLE 1

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
LANC	WYC06	CCL-TTMW006-0818	E218.6	8/30/2018	8/31/2018		9/6/2018
		CCL-TTMW009-0818	E218.6	8/30/2018	8/31/2018		9/6/2018
		CCL-TTMW022-0818	E218.6	8/30/2018	8/31/2018		9/5/2018
	WYC09	EB-LCBK-01-031219	E218.6	3/12/2019	3/13/2019		3/19/2019
	WYC10	CCL-TW19-01-0818-0419	E218.6	4/24/2019	4/25/2019		4/30/2019
		CCL-TW19-01-0818-0419MS	E218.6	4/24/2019	4/25/2019		4/30/2019
		CCL-TW19-F1-0818-0419	E218.6	4/24/2019	4/25/2019		4/30/2019
	WYC11	L3AP-TW19-01-3545-0419	E218.6	4/29/2019	4/30/2019		5/9/2019
		L3AP-TW19-02-3545-0419	E218.6	4/29/2019	4/30/2019		5/9/2019
		L3AP-TW19-02-3545-0419MS	E218.6	4/29/2019	4/30/2019		5/9/2019
		L3AP-TW19-02-3545-0419SD	E218.6	4/29/2019	4/30/2019		5/9/2019
		L3AP-TW19-03-3545-0419	E218.6	4/29/2019	4/30/2019		5/9/2019

SDG = sample delivery group

LANC = Eurofins Lancaster

STL-SEA = <<<Undefined in tblLab>>>

TAMC = TestAmerica Sacramento

TAMG = <<<Undefined in tblLab>>>

TAML = TestAmerica St. Louis

TAMQ = TestAmerica Denver

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-108850-1	20-Apr-18	WATER	N	JAW30-0418	280-108850-1	TAMG
			N	JAW31-0418	280-108850-1	TAMC
			N	JAW31-0418	280-108850-1	TAMG
			FD	LINE9-FD1	280-108850-1	TAMG
280-108898-1	23-Apr-18	WATER	N	CCLTTMW004-0418	280-108898-1	TAMQ
	22-Apr-18		FD	CONTG-FD1	280-108898-1	TAMQ
			N	G15-0418	280-108898-1	TAMQ
			N	JAW29-0418	280-108898-1	STL-SEA
	21-Apr-18		N	L9MW1-0418	280-108898-1	STL-SEA
			MS	L9MW1-0418MS	280-108898-1	STL-SEA
			SD	L9MW1-0418SD	280-108898-1	STL-SEA
			N	L9TTMW02-0418	280-108898-1	STL-SEA
280-108898-2	22-Apr-18	WATER	N	JAW29-0418	280-108898-2	TAMC
	21-Apr-18		N	L9MW1-0418	280-108898-2	TAMC
			N	L9TTMW02-0418	280-108898-2	TAMC
280-108965-1	24-Apr-18	WATER	N	G47-0418	280-108965-1	TAMQ
280-109029-1	25-Apr-18	WATER	EB	CDL-EB1-0418	280-109029-1	TAML
			MS	CDL-EB1-0418MS	280-109029-1	TAML
			SD	CDL-EB1-0418SD	280-109029-1	TAML
			EB	CONTG-EB1-0418	280-109029-1	TAMQ
			N	JAW09-0418	280-109029-1	TAML
			MS	JAW09-0418MS	280-109029-1	TAML
			SD	JAW09-0418SD	280-109029-1	TAML
			EB	LINE9-EB1-0418	280-109029-1	TAMC
			EB	LINE9-EB1-0418	280-109029-1	TAMG
280-111315-1	21-Jun-18	WATER	N	5B-DP1-0618	280-111315-1	TAMC
			N	5B-DP2-0618	280-111315-1	TAMC
			EB	EB01-0618	280-111315-1	TAMC
280-112010-1	13-Jul-18	WATER	N	L3-DP1-2530-0718	280-112010-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-113005-1	06-Aug-18	WATER	N	PDS-MW1-0818	280-113005-1	TAML
			MS	PDS-MW1-0818MS	280-113005-1	TAML
			SD	PDS-MW1-0818SD	280-113005-1	TAML
			N	PDS-MW2-0818	280-113005-1	TAML
			N	PDS-MW3-0818	280-113005-1	TAML
			N	PDS-MW4-0818	280-113005-1	TAML
280-113558-1	22-Aug-18	WATER	N	L3A-MW3A-0818	280-113558-1	TAMC
			N	L3AP-MW1-0818	280-113558-1	TAMC
			N	L3AP-MW1-0818	280-113558-1	TAMQ
			MS	L3AP-MW1-0818MS	280-113558-1	TAMQ
			MS	L3AP-MW1-0818MS	280-113558-1	TAMC
			SD	L3AP-MW1-0818SD	280-113558-1	TAMC
			SD	L3AP-MW1-0818SD	280-113558-1	TAMQ
			TB	TB-2-082218	280-113558-1	TAMQ
280-113889-1	30-Aug-18	WATER	N	CDL-JAW10-0818	280-113889-1	TAML
			MS	CDL-JAW10-0818MS	280-113889-1	TAML
			SD	CDL-JAW10-0818SD	280-113889-1	TAML
			N	CDL-JAW8-0818	280-113889-1	TAML
			MS	CDL-JAW8-0818MS	280-113889-1	TAML
			SD	CDL-JAW8-0818SD	280-113889-1	TAML
280-117127-1	16-Nov-18	WATER	TB	TB-1118	280-117127-1	TAMQ
280-117127-2	16-Nov-18	WATER	N	L1-MW107-1118	280-117127-2	TAMQ
			EB	L1-MW107-EB-1118	280-117127-2	TAMQ
280-120959-1	07-Mar-19	WATER	N	EBP-MW15-0319	280-120959-1	TAMQ
	06-Mar-19		N	EBP-MW3-0319	280-120959-1	TAML
			N	EBP-MW3-0319	280-120959-1	TAMQ
	07-Mar-19		N	EBP-MW6-0319	280-120959-1	TAMQ
	06-Mar-19		FD	EBP-MWF3-0319	280-120959-1	TAML
			FD	EBP-MWF3-0319	280-120959-1	TAMQ
			N	EDA-2-0319	280-120959-1	TAML

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-120959-1	06-Mar-19	WATER	N	EDA-2-0319	280-120959-1	TAMQ
			MS	EDA-2-0319MS	280-120959-1	TAML
			MS	EDA-2-0319MS	280-120959-1	TAMQ
			SD	EDA-2-0319SD	280-120959-1	TAML
			SD	EDA-2-0319SD	280-120959-1	TAMQ
	07-Mar-19		N	JAW-07-0319	280-120959-1	TAMQ
280-120959-2	07-Mar-19	WATER	N	WBP-TTMW-01-0319	280-120959-2	TAMQ
			N	WBP-TTMW-02-0319	280-120959-2	TAMQ
			N	WPB-99-5-0319	280-120959-2	TAML
			N	WPB-99-5-0319	280-120959-2	TAMQ
			MS	WPB-99-5-0319MS	280-120959-2	TAML
			SD	WPB-99-5-0319SD	280-120959-2	TAML
280-121026-1	08-Mar-19	WATER	N	FTP-MW1-0319	280-121028-1	TAMQ
			N	FTP-MW2-0319	280-121028-1	TAMQ
280-121028-2	07-Mar-19	WATER	TB	TB-01-030719	280-121028-2	TAMQ
			N	WBP-TTMW-01-0319	280-121028-2	TAMQ
			N	WBP-TTMW-02-0319	280-121028-2	TAMQ
280-121028-3	08-Mar-19	WATER	EB	EB-EBP-01-030819	280-121028-3	TAMQ
			EB	EB-EBP-01-030819	280-121028-3	TAML
	07-Mar-19		N	EBP-MW16-0319	280-121028-3	TAMQ
			N	EBP-MW2-0319	280-121028-3	TAML
			N	EBP-MW2-0319	280-121028-3	TAMQ
			N	EBP-MW7-0319	280-121028-3	TAMQ
	08-Mar-19		N	EDA-1-0319	280-121028-3	TAMQ
280-121068-1	08-Mar-19	WATER	N	EBP-MW13-0319	280-121068-1	TAMQ
			N	EBP-MW9-0319	280-121068-1	TAML
			N	EBP-MW9-0319	280-121068-1	TAMQ
	09-Mar-19		FD	FJAW-80-0319	280-121068-1	TAMQ
			FD	FJAW-80-0319	280-121068-1	TAML
	08-Mar-19		N	FTP-MW3-0319	280-121068-1	TAMQ

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121068-1	09-Mar-19	WATER	N	FTP-MW7-0319	280-121068-1	TAMQ
			N	FTP-MW8-0319	280-121068-1	TAMQ
	08-Mar-19		N	G-30-0319	280-121068-1	TAMQ
	09-Mar-19		N	JAW-58-0319	280-121068-1	TAML
			N	JAW-58-0319	280-121068-1	TAMQ
			N	JAW-59-0319	280-121068-1	TAML
			N	JAW-59-0319	280-121068-1	TAMQ
			N	JAW-80-0319	280-121068-1	TAML
			N	JAW-80-0319	280-121068-1	TAMQ
			MS	JAW-80-0319MS	280-121068-1	TAMQ
			MS	JAW-80-0319MS	280-121068-1	TAML
			SD	JAW-80-0319SD	280-121068-1	TAMQ
			SD	JAW-80-0319SD	280-121068-1	TAML
	08-Mar-19		TB	TB-02-030819	280-121068-1	TAMQ
	09-Mar-19		N	WBP-99-1-0319	280-121068-1	TAMQ
			N	WBP-TTMW-15-0319	280-121068-1	TAMQ
280-121140-1	12-Mar-19	WATER	EB	EB-LCBK-01-031219	280-121140-1	TAML
280-121155-1	12-Mar-19	WATER	EB	EB-WBP-01-031219	280-121155-1	TAMQ
			N	EDA-SW01-0319	280-121155-1	TAMQ
			N	EDA-SW02-0319	280-121155-1	TAML
			N	EDA-SW02-0319	280-121155-1	TAMQ
			TB	TB-03-031219	280-121155-1	TAMQ
280-121391-1	19-Mar-19	WATER	N	EDA-SW04-0319	280-121391-1	TAMQ
			N	EDA-SW04-0319	280-121391-1	TAML
			MS	EDA-SW04-0319MS	280-121391-1	TAML
			SD	EDA-SW04-0319SD	280-121391-1	TAML
280-121393-1	19-Mar-19	WATER	FD	OU3-FSW01-0319	280-121393-1	TAMQ
			N	OU3-SW01-0319	280-121393-1	TAMQ
			N	OU3-SW02-0319	280-121393-1	TAMQ
			N	OU3-SW03-0319	280-121393-1	TAMQ

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121485-1	19-Mar-19	WATER	N	EDA-SW03-0319	280-121485-1	TAMQ
			N	EDA-SW04-0319	280-121485-1	TAMQ
			N	FTA-99-1-0319	280-121485-1	TAMQ
			N	JAW-25-0319	280-121485-1	TAMQ
			N	OU3-SW04-0319	280-121485-1	TAMQ
			TB	TB-03-031919	280-121485-1	TAMQ
			N	WBP-99-2-0319	280-121485-1	TAMQ
			N	WBP-TTMW-12-0319	280-121485-1	TAMQ
			N	WBP-TTMW-13-0319	280-121485-1	TAMQ
			N	WBP-TTMW-14-0319	280-121485-1	TAMQ
280-121569-1	21-Mar-19	WATER	N	FTA-TT-MW-02-0319	280-121569-1	TAML
			N	FTP-MW4-0319	280-121569-1	TAML
			N	FTP-MW4-0319	280-121569-1	TAMQ
			MS	FTP-MW4-0319MS	280-121569-1	TAML
			MS	FTP-MW4-0319MS	280-121569-1	TAMQ
			SD	FTP-MW4-0319SD	280-121569-1	TAML
			SD	FTP-MW4-0319SD	280-121569-1	TAMQ
			N	JAW-60-0319	280-121569-1	TAML
			N	JAW-62-0319	280-121569-1	TAML
			N	JAW-63-0319	280-121569-1	TAML
			N	JAW-63-0319	280-121569-1	TAMQ
			N	SA-99-1-0319	280-121569-1	TAML
			N	SA-99-1-0319	280-121569-1	TAMQ
280-121620-1	21-Mar-19	WATER	EB	EB-FTA-01-032119	280-121620-1	TAML
			EB	EB-FTA-01-032119	280-121620-1	TAMQ
			N	FTA-99-2-0319	280-121620-1	TAMQ
			N	FTA-TT-MW-02-0319	280-121620-1	TAMQ
			N	FTA-TT-MW-03-0319	280-121620-1	TAML
			N	FTA-TT-MW-03-0319	280-121620-1	TAMQ
			N	FTA-TT-MW-04-0319	280-121620-1	TAMQ
			N	FTA-TT-MW-04-0319	280-121620-1	TAML

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121620-1	21-Mar-19	WATER	N	FTA-TT-MW-05-0319	280-121620-1	TAML
			N	FTA-TT-MW-05-0319	280-121620-1	TAMQ
			FD	FTA-TT-MW-F05-0319	280-121620-1	TAMQ
			FD	FTA-TT-MW-F05-0319	280-121620-1	TAML
			N	FTP-MW4-0319	280-121620-1	TAMQ
			MS	FTP-MW4-0319MS	280-121620-1	TAMQ
			SD	FTP-MW4-0319SD	280-121620-1	TAMQ
	22-Mar-19		N	JAW-23-0319	280-121620-1	TAML
			N	JAW-23-0319	280-121620-1	TAMQ
			N	JAW-24-0319	280-121620-1	TAML
			N	JAW-24-0319	280-121620-1	TAMQ
	21-Mar-19		N	JAW-60-0319	280-121620-1	TAMQ
			N	JAW-61-0319	280-121620-1	TAMQ
			N	JAW-62-0319	280-121620-1	TAMQ
			N	JAW-63-0319	280-121620-1	TAMQ
			N	SA-99-1-0319	280-121620-1	TAMQ
			TB	TB-FTA-032119	280-121620-1	TAMQ
	22-Mar-19		N	WBP-MW2-0319	280-121620-1	TAML
			N	WBP-MW2-0319	280-121620-1	TAMQ
			MS	WBP-MW2-0319MS	280-121620-1	TAML
			SD	WBP-MW2-0319SD	280-121620-1	TAML
			N	WBP-TTMW-03-0319	280-121620-1	TAML
			N	WBP-TTMW-03-0319	280-121620-1	TAMQ
			N	WBP-TTMW-04-0319	280-121620-1	TAMQ
			N	WBP-TTMW-08-0319	280-121620-1	TAMQ
280-121664-1	25-Mar-19	SOIL	N	CDL-SD6-0319	280-121664-1	TAMQ
			N	CDL-SD7-0319	280-121664-1	TAMQ
			N	CDL-SD8-0319	280-121664-1	TAMQ
			MS	CDL-SD8-0319MS	280-121664-1	TAMQ
			SD	CDL-SD8-0319SD	280-121664-1	TAMQ
			FD	CDL-SDF7-0319	280-121664-1	TAMQ

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121664-1	23-Mar-19	WATER	N	FTA-TT-MW-01-0319	280-121664-1	TAML
			N	FTA-TT-MW-01-0319	280-121664-1	TAMQ
			MS	FTA-TT-MW-01-0319MS	280-121664-1	TAML
			SD	FTA-TT-MW-01-0319SD	280-121664-1	TAML
			N	FTP-MW1-R0319	280-121664-1	TAMQ
			N	FTP-MW2-R0319	280-121664-1	TAMQ
			N	FTP-MW3-R0319	280-121664-1	TAMQ
			N	FTP-MW5-R0319	280-121664-1	TAMQ
	24-Mar-19		N	FTP-MW6-R0319	280-121664-1	TAMQ
			MS	FTP-MW6-R0319MS	280-121664-1	TAMQ
			SD	FTP-MW6-R0319SD	280-121664-1	TAMQ
	23-Mar-19		N	G-30-R0319	280-121664-1	TAMQ
	24-Mar-19		N	JAW-11-0319	280-121664-1	TAMQ
			MS	JAW-11-0319MS	280-121664-1	TAMQ
			SD	JAW-11-0319SD	280-121664-1	TAMQ
			N	JAW-12-0319	280-121664-1	TAMQ
			N	JAW-13-0319	280-121664-1	TAMQ
			N	JAW-14-0319	280-121664-1	TAMQ
	25-Mar-19		N	L1-MW103-0319	280-121664-1	TAMQ
	24-Mar-19		N	M-01-0319	280-121664-1	TAMQ
			N	NBP-MW1-0319	280-121664-1	TAMQ
	22-Mar-19		TB	TB-WBP-0322219	280-121664-1	TAMQ
			N	WBP-99-4-0319	280-121664-1	TAMQ
	23-Mar-19		N	WBP-99-5-R0319	280-121664-1	TAMQ
	22-Mar-19		N	WBP-99-6-0319	280-121664-1	TAMQ
	23-Mar-19		N	WBP-MW1-0319	280-121664-1	TAMQ
			N	WBP-MW1-0319	280-121664-1	TAML
			N	WBP-MW3-0319	280-121664-1	TAMQ
			N	WBP-MW8-0319	280-121664-1	TAMQ
			N	WBP-MW9-0319	280-121664-1	TAML
			N	WBP-MW9-0319	280-121664-1	TAMQ

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
280-121664-1	23-Mar-19	WATER	N	WBP-TTMW-05B-0319	280-121664-1	TAMQ
			N	WBP-TTMW-06-0319	280-121664-1	TAML
			N	WBP-TTMW-06-0319	280-121664-1	TAMQ
	24-Mar-19		N	WBP-TTMW-06-0319	280-121664-1	TAMQ
	23-Mar-19		N	WBP-TTMW-10-0319	280-121664-1	TAMQ
	22-Mar-19		N	WBP-TTMW-11-0319	280-121664-1	TAMQ
			FD	WBP-TTMW-F11-0319	280-121664-1	TAMQ
280-121734-1	25-Mar-19	WATER	N	EBP-MW13-R0319	280-121734-1	TAMQ
			N	EBP-MW17-0319	280-121734-1	TAMQ
			N	NBPLF-MW3-0319	280-121734-1	TAMQ
			TB	TB-EBP-032519	280-121734-1	TAMQ
280-123239-1	29-Apr-19	WATER	N	L3AP-TW19-01-3545-0419	280-123239-1	TAMQ
			N	L3AP-TW19-02-3545-0419	280-123239-1	TAMQ
			N	L3AP-TW19-03-3545-0419	280-123239-1	TAMQ
			TB	TB-042919	280-123239-1	TAMQ
280-123244-1	28-Apr-19	WATER	N	L3A-TW19-01-1020-0419	280-123244-1	TAMQ
	27-Apr-19		N	L3A-TW19-02-1020-0419	280-123244-1	TAMQ
			N	L3A-TW19-03-1020-0419	280-123244-1	TAMQ
	29-Apr-19		N	L3A-TW19-04B-5060-0419	280-123244-1	TAMQ
280-126174-1	11-Jul-19	WATER	N	L3A-TW19-04A-1525-0719	280-126174-1	TAMQ
320-39972-1	31-May-18	WATER	EB	EB01-0518	320-39972-1	TAMC
			N	G-40-0518	320-39972-1	TAMC
			MS	G-40-0518MS	320-39972-1	TAMC
			SD	G-40-0518SD	320-39972-1	TAMC
			N	L2-MW8-0518	320-39972-1	TAMC
			FD	L2-MWF8-0518	320-39972-1	TAMC
320-40651-1	23-Jun-18	WATER	N	CTATW001-0618	320-40651-1	TAMC
			N	CTATW002-0618	320-40651-1	TAMC
			N	CTATW003-0618	320-40651-1	TAMC
	24-Jun-18		N	CW-P-0618	320-40651-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-40651-1	24-Jun-18	WATER	N	EDA-4-0618	320-40651-1	TAMC
			N	JAW-626-0618	320-40651-1	TAMC
	25-Jun-18		N	JAW-627-0618	320-40651-1	TAMC
			N	L2-MW11-0618	320-40651-1	TAMC
	24-Jun-18		N	NBPLF-MW1-0618	320-40651-1	TAMC
			N	NBPLF-MW5-0618	320-40651-1	TAMC
320-41113-1	12-Jul-18	WATER	N	EBP-MW4-0718	320-41113-1	TAMC
			N	EBP-MW5-0718	320-41113-1	TAMC
320-41393-1	23-Jul-18	WATER	N	5A-MW1-0718	320-41393-1	TAMC
			N	5A-MW2-0718	320-41393-1	TAMC
	22-Jul-18		N	5A-MW5-0718	320-41393-1	TAMC
			FD	5A-MWF5-0718	320-41393-1	TAMC
	23-Jul-18		N	5B-MW1-0718	320-41393-1	TAMC
			N	5B-MW2-0718	320-41393-1	TAMC
	22-Jul-18		N	5B-MW4-0718	320-41393-1	TAMC
			N	JAW-606-0718	320-41393-1	TAMC
	23-Jul-18		N	JAW-607-0718	320-41393-1	TAMC
			N	JAW-608-0718	320-41393-1	TAMC
320-41441-1	24-Jul-18	WATER	N	5A-MW3-0718	320-41441-1	TAMC
			N	5B-MW3-0718	320-41441-1	TAMC
			MS	5B-MW3-0718MS	320-41441-1	TAMC
			SD	5B-MW3-0718SD	320-41441-1	TAMC
			N	JAW-609-0718	320-41441-1	TAMC
			FD	JAW-609F-0718	320-41441-1	TAMC
320-41445-1	20-Jul-18	WATER	N	5A-MW4-0718	320-41445-1	TAMC
			N	5A-MW6-0718	320-41445-1	TAMC
			N	L3-DP2-1520-0718	320-41445-1	TAMC
			N	L3-DP3-3438-0718	320-41445-1	TAMC
320-41892-1	06-Aug-18	WATER	N	PDS-MW1-0818	320-41892-1	TAMC
			MS	PDS-MW1-0818MS	320-41892-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-41892-1	06-Aug-18	WATER	SD	PDS-MW1-0818SD	320-41892-1	TAMC
			N	PDS-MW2-0818	320-41892-1	TAMC
			N	PDS-MW3-0818	320-41892-1	TAMC
			N	PDS-MW4-0818	320-41892-1	TAMC
320-42259-1	17-Aug-18	WATER	N	JAW-15-0818	320-42259-1	TAMC
	16-Aug-18		N	JAW-16-0818	320-42259-1	TAMC
			MS	JAW-16-0818MS	320-42259-1	TAMC
			SD	JAW-16-0818SD	320-42259-1	TAMC
	17-Aug-18		N	JAW-17-0818	320-42259-1	TAMC
	16-Aug-18		N	JAW-19-0818	320-42259-1	TAMC
			N	JAW-20-0818	320-42259-1	TAMC
			N	JAW-21-0818	320-42259-1	TAMC
			N	JAW-22-0818	320-42259-1	TAMC
	17-Aug-18		FD	JAW-F15-0818	320-42259-1	TAMC
	16-Aug-18		EB	L3A-EB1-0818	320-42259-1	TAMC
	17-Aug-18		N	L3AP-MW3-0818	320-42259-1	TAMC
			N	L3AP-MW3-0818	320-42259-1	TAMQ
			TB	TB-2-081718	320-42259-1	TAMQ
320-42263-1	16-Aug-18	WATER	EB	L3AP-EB1-0818	320-42263-1	TAMC
			EB	L3AP-EB1-0818	320-42263-1	TAMQ
	17-Aug-18		FD	L3AP-FMW4-0818	320-42263-1	TAMC
			FD	L3AP-FMW4-0818	320-42263-1	TAMQ
	16-Aug-18		N	L3AP-MW2-0818	320-42263-1	TAMC
			N	L3AP-MW2-0818	320-42263-1	TAMQ
	17-Aug-18		N	L3AP-MW4-0818	320-42263-1	TAMQ
			N	L3AP-MW4-0818	320-42263-1	TAMC
			TB	TB-1-081718	320-42263-1	TAMQ
320-42328-1	18-Aug-18	WATER	FD	L800-FMW12-0818	320-42328-1	TAMC
	19-Aug-18		N	L800-G17-0818	320-42328-1	TAMC
	18-Aug-18		N	L800-MW1-0818	320-42328-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-42328-1	18-Aug-18	WATER	N	L800-MW12-0818	320-42328-1	TAMC
	19-Aug-18		N	L800-MW13-0818	320-42328-1	TAMC
			N	L800-MW15-0818	320-42328-1	TAMC
	18-Aug-18		N	L800-MW18-0818	320-42328-1	TAMC
			N	L800-MW25-0818	320-42328-1	TAMC
	19-Aug-18		N	L800-MW26-0818	320-42328-1	TAMC
			N	L800-MW4-0818	320-42328-1	TAMC
			N	L800-MW7-0818	320-42328-1	TAMC
			N	L800-MW8-0818	320-42328-1	TAMC
	18-Aug-18		N	L800-MW9-0818	320-42328-1	TAMC
			MS	L800-MW9-0818MS	320-42328-1	TAMC
			SD	L800-MW9-0818SD	320-42328-1	TAMC
320-42437-1	22-Aug-18	WATER	N	L3A-MW1A-0818	320-42437-1	TAMC
	21-Aug-18		N	L3A-MW1B-0818	320-42437-1	TAMC
	22-Aug-18		N	L3A-MW4A-0818	320-42437-1	TAMC
	21-Aug-18		N	L3A-MW4B-0818	320-42437-1	TAMC
	22-Aug-18		N	L3A-MW5A-0818	320-42437-1	TAMC
320-42445-1	22-Aug-18	WATER	N	L3A-MW3B-0818	320-42445-1	TAMC
			N	L3A-MW5B-0818	320-42445-1	TAMC
	20-Aug-18		N	L800-G56-0818	320-42445-1	TAMC
			N	L800-MW14-0818	320-42445-1	TAMC
320-42600-1	28-Aug-18	WATER	N	L800-MW29-0818	320-42600-1	TAMC
			N	L800-MW30-0818	320-42600-1	TAMC
			N	L800-MW31-0818	320-42600-1	TAMC
			FD	L800-MWF30-0818	320-42600-1	TAMC
320-42602-1	28-Aug-18	WATER	N	JAW70-0818	320-42602-1	TAMC
			N	L2-MW4-0818	320-42602-1	TAMC
			N	L800-G20-0818	320-42602-1	TAMC
			N	L800-MW20-0818	320-42602-1	TAMC
320-42611-1	27-Aug-18	WATER	N	G-45-0818	320-42611-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-42611-1	27-Aug-18	WATER	N	L800-G-58-0818	320-42611-1	TAMC
			N	L800-MW28-0818	320-42611-1	TAMC
320-42636-1	28-Aug-18	WATER	N	JAW-71-0818	320-42636-1	TAMC
			N	L2-A-0818	320-42636-1	TAMC
			N	L2-MW9-0818	320-42636-1	TAMC
320-42639-1	28-Aug-18	WATER	N	L800-TTMW09-0818	320-42639-1	TAMC
			N	L800-TTMW15-0818	320-42639-1	TAMC
320-42660-1	29-Aug-18	WATER	N	L800-G-43-0818	320-42660-1	TAMC
			N	L800-MW27-0818	320-42660-1	TAMC
320-42664-1	29-Aug-18	WATER	N	L800-TTMW18-0818	320-42664-1	TAMC
			MS	L800-TTMW18-0818MMS	320-42664-1	TAMC
			SD	L800-TTMW18-0818MSD	320-42664-1	TAMC
320-42666-1	29-Aug-18	WATER	N	CCL-TTMW002-0818	320-42666-1	TAMC
			N	JAW-73-0818	320-42666-1	TAMC
320-42670-1	29-Aug-18	WATER	N	L800-TTMW01-0818	320-42670-1	TAMC
			N	L800-TTMW04-0818	320-42670-1	TAMC
320-42724-1	30-Aug-18	WATER	EB	L3A-EB-083018	320-42724-1	TAMC
			N	L3A-MW7-0818	320-42724-1	TAMC
320-42726-1	30-Aug-18	WATER	N	CCL-TTMW003-0818	320-42726-1	TAMC
	29-Aug-18		N	CCL-TTMW009-0818	320-42726-1	TAMC
			N	L2-12-C-0818	320-42726-1	TAMC
			N	L2-JAW-74-0818	320-42726-1	TAMC
320-42727-1	29-Aug-18	WATER	N	L2-12-F-0818	320-42727-1	TAMC
			N	L2-MW3-0818	320-42727-1	TAMC
320-42729-1	30-Aug-18	WATER	N	CCL-TTMW001-0818	320-42729-1	TAMC
			N	CCL-TTMW006-0818	320-42729-1	TAMC
	29-Aug-18		N	CCL-TTMW022-0818	320-42729-1	TAMC
320-42730-1	30-Aug-18	WATER	N	L3A-JAW-18-0818	320-42730-1	TAMC
	29-Aug-18		N	L3A-MW6A-0818	320-42730-1	TAMC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
320-42730-1	29-Aug-18	WATER	N	L3A-MW6B-0818	320-42730-1	TAMC
320-42739-1	30-Aug-18	WATER	N	L2-JAW-75-0818	320-42739-1	TAMC
			N	L2-MW10-0818	320-42739-1	TAMC
			N	L2-MW1-0818	320-42739-1	TAMC
			N	L2-TTMW02-0818	320-42739-1	TAMC
320-45351-1	15-Nov-18	WATER	N	G-14-1118	320-45351-1	TAMC
			N	GZ-3-1118	320-45351-1	TAMC
			N	JAW-40-1118	320-45351-1	TAMC
			N	JAW42-1118	320-45351-1	TAMC
			N	JAW-47-1118	320-45351-1	TAMC
	14-Nov-18		N	JAW-52-1118	320-45351-1	TAMC
			MS	JAW-52-1118MS	320-45351-1	TAMC
			SD	JAW-52-1118SD	320-45351-1	TAMC
			EB	JAW-52-EB-1118	320-45351-1	TAMC
	15-Nov-18		N	L1-MW102-1118	320-45351-1	TAMC
			N	L1-MW104-1118	320-45351-1	TAMC
			N	L1-MW-105-1118	320-45351-1	TAMC
			N	L1-MW106-1118	320-45351-1	TAMC
			N	L1-TTMW-100-1118	320-45351-1	TAMC
			N	L1-TTMW-101-1118	320-45351-1	TAMC
320-45381-1	16-Nov-18	WATER	N	GZ-2-1118	320-45381-1	TAMC
			N	GZ-2A-1118	320-45381-1	TAMC
			N	JAW-41-1118	320-45381-1	TAMC
			N	LI-MW107-1118	320-45381-1	TAMC
WYC04	22-Aug-18	WATER	EB	L3AP-EB1-0818	WYC04	LANC
			FD	L3AP-FMW4-0818	WYC04	LANC
			N	L3AP-MW1-0818	WYC04	LANC
			MS	L3AP-MW1-0818MS	WYC04	LANC
			SD	L3AP-MW1-0818SD	WYC04	LANC
	21-Aug-18		N	L3AP-MW2-0818	WYC04	LANC

TABLE 2

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
WYC04	22-Aug-18	WATER	N	L3AP-MW3-0818	WYC04	LANC
			N	L3AP-MW4-0818	WYC04	LANC
WYC05	29-Aug-18	WATER	N	CCL-TTMW002-0818	WYC05	LANC
WYC06	30-Aug-18	WATER	N	CCL-TTMW001-0818	WYC06	LANC
			N	CCL-TTMW003-0818	WYC06	LANC
			N	CCL-TTMW004-0818	WYC06	LANC
			N	CCL-TTMW006-0818	WYC06	LANC
			N	CCL-TTMW009-0818	WYC06	LANC
			N	CCL-TTMW022-0818	WYC06	LANC
WYC09	12-Mar-19	WATER	EB	EB-LCBK-01-031219	WYC09	LANC
WYC10	24-Apr-19	WATER	N	CCL-TW19-01-0818-0419	WYC10	LANC
			MS	CCL-TW19-01-0818-0419MS	WYC10	LANC
			FD	CCL-TW19-F1-0818-0419	WYC10	LANC
WYC11	29-Apr-19	WATER	N	L3AP-TW19-01-3545-0419	WYC11	LANC
			N	L3AP-TW19-02-3545-0419	WYC11	LANC
			MS	L3AP-TW19-02-3545-0419MS	WYC11	LANC
			SD	L3AP-TW19-02-3545-0419SD	WYC11	LANC
			N	L3AP-TW19-03-3545-0419	WYC11	LANC

SDG = Sample delivery group
LANC = Eurofins Lancaster
STL-SEA = <<<Undefined in tblLab>>>
TAMC = TestAmerica Sacramento
TAMG = <<<Undefined in tblLab>>>
TAML = TestAmerica St. Louis
TAMQ = TestAmerica Denver

QAQC Type
EB = Equipment (Rinsate) Blank
FD = Field Duplicate
MS = Matrix Spike
N = Normal
SD = Matrix Spike Duplicate
TB = Trip Blank

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

SOIL

SW8082

Aroclor-1016 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1221 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1232 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1242 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1248 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1254 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

Aroclor-1260 4

Validation Flag Category: SurrogateRecovery 1 UJ Flags (25.00%) for Surrogate recovery less than lower limit

WATER

E218.6

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples				
WATER							
	E218.6						
		Hexavalent Chromium	17				
Validation Flag Category: Matrix			1	J	Flags	(5.88%)	for Matrix spike RPD criteria exceedance
Validation Flag Category: Matrix			1	J	Flags	(5.88%)	for Matrix spike recovery greater than upper control limit
Validation Flag Category: Matrix			1	J	Flags	(5.88%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Matrix			1	J	Flags	(5.88%)	for Matrix spike duplicate recovery criteria greater than upper control limit
	SW6020						
		Barium	32				
Validation Flag Category: Matrix			4	J	Flags	(12.50%)	for Post-Digestion Spike recovery less than the lower control limit
Validation Flag Category: Matrix			1	J	Flags	(3.13%)	for Post digestion spike failed
		Calcium	2				
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Dissolved metal result greater than the total metal result
		Calcium, dissolved	2				
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Dissolved metal result greater than the total metal result
		Magnesium	2				
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Dissolved metal result greater than the total metal result
		Magnesium, dissolved	2				
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Dissolved metal result greater than the total metal result
		Manganese	2				
Validation Flag Category: Matrix			1	J	Flags	(50.00%)	for Post-Digestion Spike recovery less than the lower control limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte					Number of Samples		
WATER									
	SW6020								
		Potassium					2		
Validation Flag Category:		Matrix	1	J	Flags	(50.00%)		for	Dissolved metal result greater than the total metal result
		Potassium, dissolved					2		
Validation Flag Category:		Matrix	1	J	Flags	(50.00%)		for	Dissolved metal result greater than the total metal result
		Sodium					2		
Validation Flag Category:		Matrix	1	J	Flags	(50.00%)		for	Dissolved metal result greater than the total metal result
		Sodium, dissolved					2		
Validation Flag Category:		Matrix	1	J	Flags	(50.00%)		for	Dissolved metal result greater than the total metal result
	SW8151A								
		Pentachlorophenol					3		
Validation Flag Category:		HoldingTime	3	UJ	Flags	(100.00%)		for	Holding time exceeded
	SW8260B								
		1,1,1,2-Tetrachloroethane					64		
Validation Flag Category:		Matrix	2	UJ	Flags	(3.13%)		for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)		for	Sample Integrity
		1,1,1-TCA					64		
Validation Flag Category:		InternalStandard	2	J	Flags	(3.13%)		for	Internal standard response less than lower control limit
Validation Flag Category:		Miscellaneous	13	UJ	Flags	(20.31%)		for	Sample Integrity
Validation Flag Category:		Miscellaneous	8	J	Flags	(12.50%)		for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte					Number of Samples		
WATER									
	SW8260B								
		1,1,2,2-Tetrachloroethane					64		
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)		for	Sample Integrity
		1,1,2-TCA					64		
Validation Flag Category:		InternalStandard	1	J	Flags	(1.56%)		for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)		for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	19	UJ	Flags	(29.69%)		for	Sample Integrity
Validation Flag Category:		Miscellaneous	2	J	Flags	(3.13%)		for	Sample Integrity
		1,1,2-Trichloro-1,2,2-trifluoroethane					44		
Validation Flag Category:		Blank	4	U	Flags	(9.09%)		for	Trip blank concentration less than RL
Validation Flag Category:		InternalStandard	2	J	Flags	(4.55%)		for	Internal standard response less than lower control limit
Validation Flag Category:		LaboratoryControlSample	3	J	Flags	(6.82%)		for	LCSD RPD criteria exceeded
Validation Flag Category:		Matrix	1	J	Flags	(2.27%)		for	Matrix spike RPD criteria exceedance
Validation Flag Category:		Matrix	1	J	Flags	(2.27%)		for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	8	UJ	Flags	(18.18%)		for	Sample Integrity
Validation Flag Category:		Miscellaneous	5	J	Flags	(11.36%)		for	Sample Integrity
		1,1-DCA					64		
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)		for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)		for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	10	UJ	Flags	(15.63%)		for	Sample Integrity
Validation Flag Category:		Miscellaneous	11	J	Flags	(17.19%)		for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		1,1-DCE		63				
Validation Flag Category:	LaboratoryControlSample		4	J	Flags	(6.35%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	Matrix		1	UJ	Flags	(1.59%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(1.59%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		1	J	Flags	(1.59%)	for	Matrix spike recovery greater than upper control limit
Validation Flag Category:	Miscellaneous		15	UJ	Flags	(23.81%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		5	J	Flags	(7.94%)	for	Sample Integrity
		1,1-Dichloropropene		64				
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity
		1,2,3-Trichlorobenzene		64				
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity
		1,2,3-Trichloropropane		64				
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity
		1,2,4-Trichlorobenzene		64				
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity
		1,2,4-Trimethylbenzene		64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous		17	UJ	Flags	(26.56%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		4	J	Flags	(6.25%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples				
WATER							
	SW8260B						
		1,2-DCA	64				
Validation Flag Category:	Blank		1	U	Flags	(1.56%)	for Equipment blank concentration less than the RL
Validation Flag Category:	InternalStandard		1	J	Flags	(1.56%)	for Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for Sample Integrity
		1,2-DCB	64				
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for Sample Integrity
		1,2-Dibromo-3-chloropropane	64				
Validation Flag Category:	Calibration		9	UJ	Flags	(14.06%)	for Continuing calibration recovery less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for Sample Integrity
		1,2-Dibromoethane (EDB)	64				
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for Sample Integrity
		1,2-Dichloropropane	64				
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for Sample Integrity
		1,3,5-Trimethylbenzene	64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		1,3-DCB		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		1,3-Dichloropropane		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		1,4-DCB		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		1-Chlorohexane		64				
Validation Flag Category:		InternalStandard	1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Miscellaneous	20	UJ	Flags	(31.25%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	1	J	Flags	(1.56%)	for	Sample Integrity
		2,2-Dichloropropane		64				
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		2-Chlorotoluene		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		2-Hexanone		64				
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8260B

4-Chlorotoluene 64

Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity

Acetone 64

Validation Flag Category: Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity

Benzene 64

Validation Flag Category: InternalStandard	4	J	Flags	(6.25%)	for	Internal standard response less than lower control limit
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	13	UJ	Flags	(20.31%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	8	J	Flags	(12.50%)	for	Sample Integrity

Bromobenzene 64

Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity

Bromochloromethane 64

Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity

Bromodichloromethane 64

Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		Bromoform		64				
Validation Flag Category:	Calibration		9	UJ	Flags	(14.06%)	for	Continuing calibration recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity
		Bromomethane		64				
Validation Flag Category:	Calibration		15	UJ	Flags	(23.44%)	for	Continuing calibration recovery less than lower control limit
Validation Flag Category:	InternalStandard		2	J	Flags	(3.13%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous		17	UJ	Flags	(26.56%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		4	J	Flags	(6.25%)	for	Sample Integrity
		Carbon disulfide		64				
Validation Flag Category:	InternalStandard		1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category:	LaboratoryControlSample		1	UJ	Flags	(1.56%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(3.13%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		2	J	Flags	(3.13%)	for	Sample Integrity
		Carbon tetrachloride		64				
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		Chlorobenzene		64				
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity
		Chloroethane		63				
Validation Flag Category:	InternalStandard		1	J	Flags	(1.59%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.59%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Miscellaneous		19	UJ	Flags	(30.16%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		2	J	Flags	(3.17%)	for	Sample Integrity
		Chloroform		64				
Validation Flag Category:	Blank		10	U	Flags	(15.63%)	for	Equipment blank concentration greater than the RL
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		14	UJ	Flags	(21.88%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		7	J	Flags	(10.94%)	for	Sample Integrity
		Chloromethane		64				
Validation Flag Category:	InternalStandard		1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		Cis-1,2-DCE		64				
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	13	UJ	Flags	(20.31%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	8	J	Flags	(12.50%)	for	Sample Integrity
		cis-1,3-Dichloropropene		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Dibromochloromethane		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Dibromomethane		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Dichlorodifluoromethane		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:		Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8260B

Ethylbenzene 64

Validation Flag Category: InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	15	UJ	Flags	(23.44%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	6	J	Flags	(9.38%)	for	Sample Integrity

Hexachlorobutadiene 64

Validation Flag Category: Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity

Isopropylbenzene 64

Validation Flag Category: InternalStandard	2	J	Flags	(3.13%)	for	Internal standard response less than lower control limit
Validation Flag Category: Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity

m,p-Xylene 64

Validation Flag Category: InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category: Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category: Miscellaneous	17	UJ	Flags	(26.56%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	4	J	Flags	(6.25%)	for	Sample Integrity

MEK (2-Butanone) 64

Validation Flag Category: InternalStandard	1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category: Miscellaneous	20	UJ	Flags	(31.25%)	for	Sample Integrity
Validation Flag Category: Miscellaneous	1	J	Flags	(1.56%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8260B							
		Methyl tert-butyl ether (MTBE)	64					
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Methylene chloride	64					
Validation Flag Category:		Blank	2	U	Flags	(3.13%)	for	Equipment blank concentration less than the RL
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		MIBK (Methyl isobutyl ketone)	64					
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Naphthalene	64					
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Miscellaneous	18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	3	J	Flags	(4.69%)	for	Sample Integrity
		n-Butylbenzene	64					
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	3	J	Flags	(4.69%)	for	Sample Integrity
		n-Propylbenzene	64					
Validation Flag Category:		InternalStandard	3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Miscellaneous	17	UJ	Flags	(26.56%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	4	J	Flags	(6.25%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		o-Xylene		64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for	Sample Integrity
		p-Isopropyltoluene		64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for	Sample Integrity
		sec-Butylbenzene		64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		2	UJ	Flags	(3.13%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		17	UJ	Flags	(26.56%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		4	J	Flags	(6.25%)	for	Sample Integrity
		Styrene		64				
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		TCE		64				
Validation Flag Category:	InternalStandard		4	J	Flags	(6.25%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		12	UJ	Flags	(18.75%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		9	J	Flags	(14.06%)	for	Sample Integrity
		tert-Butylbenzene		64				
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		21	UJ	Flags	(32.81%)	for	Sample Integrity
		Tetrachloroethene		64				
Validation Flag Category:	InternalStandard		1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Miscellaneous		16	UJ	Flags	(25.00%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		5	J	Flags	(7.81%)	for	Sample Integrity
		Toluene		64				
Validation Flag Category:	InternalStandard		3	J	Flags	(4.69%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		17	UJ	Flags	(26.56%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		4	J	Flags	(6.25%)	for	Sample Integrity
		trans-1,2-DCE		64				
Validation Flag Category:	InternalStandard		2	J	Flags	(3.13%)	for	Internal standard response less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(1.56%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Miscellaneous		18	UJ	Flags	(28.13%)	for	Sample Integrity
Validation Flag Category:	Miscellaneous		3	J	Flags	(4.69%)	for	Sample Integrity

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples				
WATER								
	SW8260B							
		trans-1,3-Dichloropropene		64				
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Trichlorofluoromethane		64				
Validation Flag Category:		Matrix	1	UJ	Flags	(1.56%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:		Miscellaneous	21	UJ	Flags	(32.81%)	for	Sample Integrity
		Vinyl chloride		64				
Validation Flag Category:		InternalStandard	1	J	Flags	(1.56%)	for	Internal standard response less than lower control limit
Validation Flag Category:		Miscellaneous	19	UJ	Flags	(29.69%)	for	Sample Integrity
Validation Flag Category:		Miscellaneous	2	J	Flags	(3.13%)	for	Sample Integrity
	SW8290							
		1,2,3,4,6,7,8,9-Octachlorodibenzofuran		4				
Validation Flag Category:		Blank	2	U	Flags	(50.00%)	for	Laboratory blank contamination less than the RL
		1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin		4				
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than 1/2 the RL
		1,2,3,4,6,7,8-Heptachlorodibenzofuran		4				
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	3	U	Flags	(75.00%)	for	Estimated Maximum Possible Concentration

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte							
WATER									
	SW8290								
		1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin				4			
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration
		1,2,3,4,7,8,9-Heptachlorodibenzofuran				4			
Validation Flag Category:		Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
		1,2,3,4,7,8-Hexachlorodibenzofuran				4			
Validation Flag Category:		Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration
		1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin				4			
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than 1/2 the RL
Validation Flag Category:		LaboratoryControlSample	2	J	Flags	(50.00%)	for	LCS recovery greater than upper control limit
Validation Flag Category:		Matrix	1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration
		1,2,3,6,7,8-Hexachlorodibenzofuran				4			
Validation Flag Category:		Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
		1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin				4			
Validation Flag Category:		Matrix	1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration
		1,2,3,7,8,9-Hexachlorodibenzofuran				4			
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration

Number of Samples column: values shown as 4 beside each analyte.

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8290

	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin			4			
Validation Flag Category:	Matrix	1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration
	1,2,3,7,8-Pentachlorodibenzofuran			4			
Validation Flag Category:	Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
	2,3,7,8-Tetrachlorodibenzo-p-dioxin			4			
Validation Flag Category:	Blank	2	U	Flags	(50.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:	Matrix	2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration
	Total HpCDD			4			
Validation Flag Category:	Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:	Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than 1/2 the RL
Validation Flag Category:	Matrix	2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration
	Total HpCDF			4			
Validation Flag Category:	Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:	Matrix	3	U	Flags	(75.00%)	for	Estimated Maximum Possible Concentration
	Total HxCDD			4			
Validation Flag Category:	Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:	Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than 1/2 the RL
Validation Flag Category:	Matrix	2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8290							
		Total HxCDF	4					
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	3	U	Flags	(75.00%)	for	Estimated Maximum Possible Concentration
		Total PeCDF	4					
Validation Flag Category:		Blank	1	U	Flags	(25.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	1	U	Flags	(25.00%)	for	Estimated Maximum Possible Concentration
		Total TCDD	4					
Validation Flag Category:		Blank	2	U	Flags	(50.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	2	U	Flags	(50.00%)	for	Estimated Maximum Possible Concentration
		Total TCDF	4					
Validation Flag Category:		Blank	3	U	Flags	(75.00%)	for	Laboratory blank contamination less than the RL
Validation Flag Category:		Matrix	3	U	Flags	(75.00%)	for	Estimated Maximum Possible Concentration
	SW8330B							

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples					
WATER									
	SW8330B								
		1,3,5-Trinitrobenzene		212					
Validation Flag Category:		Blank	3	UJ	Flags	(1.42%)	for	Temperature Blank>6C	
Validation Flag Category:		Blank	2	J	Flags	(0.94%)	for	Temperature Blank>6C	
Validation Flag Category:		Confirmation	8	J	Flags	(3.77%)	for	Confirmation Precision Exceeded	
Validation Flag Category:		Matrix	1	UJ	Flags	(0.47%)	for	Matrix spike RPD criteria exceedance	
Validation Flag Category:		Matrix	1	UJ	Flags	(0.47%)	for	Matrix Interference	
Validation Flag Category:		Matrix	1	J	Flags	(0.47%)	for	Matrix spike RPD criteria exceedance	
Validation Flag Category:		Matrix	1	J	Flags	(0.47%)	for	Matrix spike recovery less than lower control limit	
Validation Flag Category:		Matrix	1	J	Flags	(0.47%)	for	Matrix spike duplicate recovery criteria less than lower control limit	
Validation Flag Category:		Matrix	1	J	Flags	(0.47%)	for	Matrix Interference	
Validation Flag Category:		SurrogateRecovery	28	UJ	Flags	(13.21%)	for	Surrogate recovery less than lower limit	
Validation Flag Category:		SurrogateRecovery	1	J	Flags	(0.47%)	for	Surrogate recovery less than lower limit	
Validation Flag Category:		SurrogateRecovery	3	J	Flags	(1.42%)	for	Surrogate recovery greater than upper limit	
		1,3-Dinitrobenzene		210					
Validation Flag Category:		Blank	5	UJ	Flags	(2.38%)	for	Temperature Blank>6C	
Validation Flag Category:		Confirmation	5	J	Flags	(2.38%)	for	Confirmation Precision Exceeded	
Validation Flag Category:		LaboratoryControlSample	2	UJ	Flags	(0.95%)	for	LCSD recovery less than the lower control limit	
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix Interference	
Validation Flag Category:		SurrogateRecovery	28	UJ	Flags	(13.33%)	for	Surrogate recovery less than lower limit	
Validation Flag Category:		SurrogateRecovery	1	UJ	Flags	(0.48%)	for	Surrogate recovery greater than upper limit	
Validation Flag Category:		SurrogateRecovery	2	J	Flags	(0.95%)	for	Surrogate recovery greater than upper limit	

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8330B

2,4,6-Trinitrotoluene 211

Validation Flag Category:	Blank	5	UJ	Flags	(2.37%)	for Temperature Blank>6C
Validation Flag Category:	Confirmation	2	J	Flags	(0.95%)	for Confirmation Precision Exceeded
Validation Flag Category:	Matrix	1	UJ	Flags	(0.47%)	for Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix	2	UJ	Flags	(0.95%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix	2	UJ	Flags	(0.95%)	for Matrix Interference
Validation Flag Category:	SurrogateRecovery	27	UJ	Flags	(12.80%)	for Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	2	J	Flags	(0.95%)	for Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	1	J	Flags	(0.47%)	for Surrogate recovery greater than upper limit

2,4-Dinitrotoluene 210

Validation Flag Category:	Blank	5	UJ	Flags	(2.38%)	for Temperature Blank>6C
Validation Flag Category:	LaboratoryControlSample	2	UJ	Flags	(0.95%)	for LCSD recovery less than the lower control limit
Validation Flag Category:	Matrix	2	UJ	Flags	(0.95%)	for Matrix Interference
Validation Flag Category:	SurrogateRecovery	27	UJ	Flags	(12.86%)	for Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	1	J	Flags	(0.48%)	for Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	1	J	Flags	(0.48%)	for Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte					Number of Samples	
WATER								
	SW8330B							
		2,6-Dinitrotoluene					210	
Validation Flag Category:	Blank		5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		5	J	Flags	(2.38%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.95%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		26	UJ	Flags	(12.38%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		2	J	Flags	(0.95%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		4	J	Flags	(1.90%)	for	Surrogate recovery greater than upper limit
		2-Amino-4,6-dinitrotoluene					210	
Validation Flag Category:	Blank		5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		6	J	Flags	(2.86%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.95%)	for	LCS recovery less than lower control limit
Validation Flag Category:	LaboratoryControlSample		2	J	Flags	(0.95%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	LaboratoryControlSample		2	J	Flags	(0.95%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		27	UJ	Flags	(12.86%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		2	J	Flags	(0.95%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		3	J	Flags	(1.43%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		4-Amino-2,6-dinitrotoluene	209					
Validation Flag Category:	Blank		5	UJ	Flags	(2.39%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		10	J	Flags	(4.78%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.96%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample		3	UJ	Flags	(1.44%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	LaboratoryControlSample		16	UJ	Flags	(7.66%)	for	LCS recovery less than lower control limit
Validation Flag Category:	LaboratoryControlSample		3	J	Flags	(1.44%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	LaboratoryControlSample		3	J	Flags	(1.44%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix spike RPD criteria exceedance
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		26	UJ	Flags	(12.44%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	J	Flags	(0.48%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		4	J	Flags	(1.91%)	for	Surrogate recovery greater than upper limit
		hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)	205					
Validation Flag Category:	Blank		5	UJ	Flags	(2.44%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		6	J	Flags	(2.93%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Matrix		1	UJ	Flags	(0.49%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.49%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		22	UJ	Flags	(10.73%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		5	J	Flags	(2.44%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		5	J	Flags	(2.44%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)	207					
Validation Flag Category:	Blank		5	UJ	Flags	(2.42%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		1	UJ	Flags	(0.48%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Confirmation		24	J	Flags	(11.59%)	for	Confirmation Precision Exceeded
Validation Flag Category:	FieldDuplicate		2	J	Flags	(0.97%)	for	Field duplicate exceeds RPD criteria
Validation Flag Category:	Matrix		1	UJ	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		23	UJ	Flags	(11.11%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		5	J	Flags	(2.42%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		2	J	Flags	(0.97%)	for	Surrogate recovery greater than upper limit
		hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)	208					
Validation Flag Category:	Blank		5	UJ	Flags	(2.40%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		6	J	Flags	(2.88%)	for	Confirmation Precision Exceeded
Validation Flag Category:	Matrix		2	J	Flags	(0.96%)	for	Matrix Interference
Validation Flag Category:	SurrogateRecovery		22	UJ	Flags	(10.58%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		6	J	Flags	(2.88%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		3	J	Flags	(1.44%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8330B

HMX 191

Validation Flag Category:	Blank	4	UJ	Flags	(2.09%)	for Temperature Blank>6C
Validation Flag Category:	Blank	1	J	Flags	(0.52%)	for Temperature Blank>6C
Validation Flag Category:	Confirmation	14	J	Flags	(7.33%)	for Confirmation Precision Exceeded
Validation Flag Category:	Matrix	1	UJ	Flags	(0.52%)	for Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix	1	UJ	Flags	(0.52%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix spike recovery greater than upper control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix spike duplicate recovery criteria greater than upper control limit
Validation Flag Category:	Matrix	1	J	Flags	(0.52%)	for Matrix Interference
Validation Flag Category:	SurrogateRecovery	20	UJ	Flags	(10.47%)	for Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	8	J	Flags	(4.19%)	for Surrogate recovery less than lower limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples					
WATER									
	SW8330B								
		m-Nitrotoluene		210					
Validation Flag Category:			1	UJ	Flags	(0.48%)	for	
Validation Flag Category:		Blank	5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:		Confirmation	3	J	Flags	(1.43%)	for	Confirmation Precision Exceeded
Validation Flag Category:		LaboratoryControlSample	2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded
Validation Flag Category:		LaboratoryControlSample	13	UJ	Flags	(6.19%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:		LaboratoryControlSample	15	UJ	Flags	(7.14%)	for	LCS recovery less than lower control limit
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:		Matrix	3	UJ	Flags	(1.43%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:		Matrix	1	J	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:		Matrix	1	J	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		SurrogateRecovery	28	UJ	Flags	(13.33%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	1	UJ	Flags	(0.48%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples

WATER

SW8330B

Nitrobenzene 210

Validation Flag Category:	Blank	4	UJ	Flags	(1.90%)	for Temperature Blank>6C
Validation Flag Category:	Blank	1	J	Flags	(0.48%)	for Temperature Blank>6C
Validation Flag Category:	Confirmation	4	J	Flags	(1.90%)	for Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample	2	UJ	Flags	(0.95%)	for LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample	13	UJ	Flags	(6.19%)	for LCS recovery less than lower control limit
Validation Flag Category:	Matrix	1	UJ	Flags	(0.48%)	for Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix	1	UJ	Flags	(0.48%)	for Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix	2	UJ	Flags	(0.95%)	for Matrix Interference
Validation Flag Category:	SurrogateRecovery	27	UJ	Flags	(12.86%)	for Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	1	J	Flags	(0.48%)	for Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery	3	J	Flags	(1.43%)	for Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte	Number of Samples					
WATER								
	SW8330B							
		o-Nitrotoluene	210					
Validation Flag Category:	Blank		5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:	Confirmation		2	J	Flags	(0.95%)	for	Confirmation Precision Exceeded
Validation Flag Category:	LaboratoryControlSample		2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded
Validation Flag Category:	LaboratoryControlSample		13	UJ	Flags	(6.19%)	for	LCSD recovery less than the lower control limit
Validation Flag Category:	LaboratoryControlSample		32	UJ	Flags	(15.24%)	for	LCS recovery less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		3	UJ	Flags	(1.43%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	Matrix		2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:	Matrix		1	J	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:	SurrogateRecovery		28	UJ	Flags	(13.33%)	for	Surrogate recovery less than lower limit
Validation Flag Category:	SurrogateRecovery		1	UJ	Flags	(0.48%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte					Number of Samples	
WATER								
	SW8330B							
		p-Nitrotoluene					210	
Validation Flag Category:		Blank	5	UJ	Flags	(2.38%)	for	Temperature Blank>6C
Validation Flag Category:		Confirmation	2	J	Flags	(0.95%)	for	Confirmation Precision Exceeded
Validation Flag Category:		LaboratoryControlSample	2	UJ	Flags	(0.95%)	for	LCSD RPD criteria exceeded
Validation Flag Category:		LaboratoryControlSample	13	UJ	Flags	(6.19%)	for	LCS recovery less than lower control limit
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Matrix	2	UJ	Flags	(0.95%)	for	Matrix Interference
Validation Flag Category:		Matrix	1	J	Flags	(0.48%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:		Matrix	1	J	Flags	(0.48%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		SurrogateRecovery	27	UJ	Flags	(12.86%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	1	UJ	Flags	(0.48%)	for	Surrogate recovery greater than upper limit
Validation Flag Category:		SurrogateRecovery	1	J	Flags	(0.48%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	1	J	Flags	(0.48%)	for	Surrogate recovery greater than upper limit
		RDX					182	
Validation Flag Category:		Blank	4	UJ	Flags	(2.20%)	for	Temperature Blank>6C
Validation Flag Category:		Blank	1	J	Flags	(0.55%)	for	Temperature Blank>6C
Validation Flag Category:		Confirmation	5	J	Flags	(2.75%)	for	Confirmation Precision Exceeded
Validation Flag Category:		Matrix	1	UJ	Flags	(0.55%)	for	Matrix Interference
Validation Flag Category:		Matrix	1	J	Flags	(0.55%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:		SurrogateRecovery	21	UJ	Flags	(11.54%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	6	J	Flags	(3.30%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery	2	J	Flags	(1.10%)	for	Surrogate recovery greater than upper limit

TABLE 3

Site Completeness by Analyte - Flagging Statistics

Matrix	Method	Analyte		Number of Samples					
WATER									
	SW8330B								
		Tetryl				212			
Validation Flag Category:		Blank		5	UJ	Flags	(2.36%)	for	Temperature Blank>6C
Validation Flag Category:		Confirmation		3	J	Flags	(1.42%)	for	Confirmation Precision Exceeded
Validation Flag Category:		Matrix		1	UJ	Flags	(0.47%)	for	Matrix spike recovery less than lower control limit
Validation Flag Category:		Matrix		2	UJ	Flags	(0.94%)	for	Matrix spike duplicate recovery criteria less than lower control limit
Validation Flag Category:		Matrix		2	UJ	Flags	(0.94%)	for	Matrix Interference
Validation Flag Category:		SurrogateRecovery		28	UJ	Flags	(13.21%)	for	Surrogate recovery less than lower limit
Validation Flag Category:		SurrogateRecovery		1	UJ	Flags	(0.47%)	for	Surrogate recovery greater than upper limit
Validation Flag Category:		SurrogateRecovery		2	J	Flags	(0.94%)	for	Surrogate recovery greater than upper limit

Note: The total number of validation flags may exceed the actual number of samples if multiple flags were applied to the same sample. Consequently, the percentage of total flags (flags applied/number of samples) may exceed 100 percent.

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

U = The analyte was not detected in the analysis. The associated numerical value is at or below the method detection limit (MDL).

UJ = The analyte was not detected, the quantitation is an estimate.

TABLE 4

Holding Times - Qualified Data

Method	Matrix	Sample Identification	Analyte	Holding Time	Result	Holding Time Qualifier	Criteria	Final Flag*
SW8151A	WATER	JAW30-0418						
			Pentachlorophenol	10 Days	0.0058 ug/L	UJ	HTp>UCL	UJ
SW8151A	WATER	JAW31-0418						
			Pentachlorophenol	10 Days	0.0057 ug/L	UJ	HTp>UCL	UJ
SW8151A	WATER	LINE9-FD1						
			Pentachlorophenol	10 Days	0.0061 ug/L	UJ	HTp>UCL	UJ
SW8330B	WATER	CCLTTMW004-0418						
			1,3,5-Trinitrobenzene	10 Days	0.4 ug/L	UJ	HTp>UCL	UJ
			1,3-Dinitrobenzene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			2,4,6-Trinitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			2,4-Dinitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			2,6-Dinitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			2-Amino-4,6-dinitrotoluene	10 Days	0.12 ug/L	UJ	HTp>UCL	UJ
			4-Amino-2,6-dinitrotoluene	10 Days	0.12 ug/L	UJ	HTp>UCL	UJ
			m-Nitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			o-Nitrotoluene	10 Days	0.2 ug/L	UJ	HTp>UCL	UJ
			p-Nitrotoluene	10 Days	0.4 ug/L	UJ	HTp>UCL	UJ
SW8330B	WATER	G47-0418						
			1,3-Dinitrobenzene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			2,4,6-Trinitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			2,4-Dinitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			2,6-Dinitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			2-Amino-4,6-dinitrotoluene	13 Days	0.12 ug/L	UJ	HTp>UCL	UJ
			4-Amino-2,6-dinitrotoluene	13 Days	0.12 ug/L	UJ	HTp>UCL	UJ
			m-Nitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			Nitrobenzene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			o-Nitrotoluene	13 Days	0.21 ug/L	UJ	HTp>UCL	UJ
			p-Nitrotoluene	13 Days	0.25 ug/L	J	HTp>UCL	J
SW8330B	WATER	GZ-2A-1118						

TABLE 4

Holding Times - Qualified Data

Method	Matrix	Sample Identification	Analyte	Holding Time	Result	Holding Time Qualifier	Criteria	Final Flag*
SW8330B	WATER	GZ-2A-1118						
			hexahydro-1,3,5-trinitroso-1,3,5-tri	41 Days	59 ug/L	J	HTp>UCL	J
			hexahydro-1,3-dinitroso-5-nitro-1,3	41 Days	21 ug/L	J	HTp>UCL	J
			hexahydro-1-nitroso-3,5-dinitro-1,3	41 Days	110 ug/L	J	HTp>UCL	J
			HMX	41 Days	600 ug/L	J	HTp>UCL	J
			RDX	41 Days	3200 ug/L	J	HTp>UCL	J
SW8330B	WATER	L3A-JAW-18-0818						
			RDX	56 Days	100 ug/L	J	HTa>UCL	J

ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

HTa>UCL = Holding time exceeded

HTp>UCL = Holding time exceeded

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): E218.6 (WATER)					
Hexavalent Chromium	L3AP-MW1-0818	0.42 UG/L	J	%R = 125 LCL=90 UCL=110	MS>UCL
	L3AP-MW1-0818	0.42 UG/L	J	MSRPD = 26.67 Limit =20	MSRPD
	L3AP-MW1-0818	0.42 UG/L	J	%R = 84 LCL=90 UCL=110	SD<LCL
	L3AP-TW19-02-3545-0419	0.23 UG/L	J	%R = 111 LCL=90 UCL=110	SD>UCL
Method (Matrix): SW6020 (WATER)					
Barium	FJAW-80-0319	0.26 mg/L	J		PDS<LCL
	JAW-58-0319	0.093 mg/L	J		PDS<LCL
	JAW-59-0319	0.16 mg/L	J		PDS<LCL
	JAW-80-0319	0.23 mg/L	J		PDS<LCL
	WPB-99-5-0319	0.96 mg/L	J		PDS<LCL
Calcium	EDA-SW04-0319	80 mg/L	J	%D=21.2 vs 10%	Dissolved>Total
Calcium, dissolved	EDA-SW04-0319	99 mg/L	J	%D=21.2 vs 10%	Dissolved>Total
Magnesium	EDA-SW04-0319	31 mg/L	J	%D=14.9 vs 10%	Dissolved>Total
Magnesium, dissolved	EDA-SW04-0319	36 mg/L	J	%D=14.9 vs 10%	Dissolved>Total
Manganese	EDA-SW04-0319	0.14 mg/L	J		PDS<LCL
Potassium	EDA-SW04-0319	8.5 mg/L	J	%D=25.6 vs 10%	Dissolved>Total
Potassium, dissolved	EDA-SW04-0319	11 mg/L	J	%D=25.6 vs 10%	Dissolved>Total
Sodium	EDA-SW04-0319	120 mg/L	J	%D=15.4 vs 10%	Dissolved>Total
Sodium, dissolved	EDA-SW04-0319	140 mg/L	J	%D=15.4 vs 10%	Dissolved>Total
Method (Matrix): SW8260B (WATER)					
1,1,1,2-Tetrachloroethane	FTP-MW4-0319	0.8 ug/L	UJ	%R = 74 LCL=78 UCL=124	SD<LCL
	JAW-80-0319	0.8 ug/L	UJ	%R = 76 LCL=78 UCL=124	SD<LCL
1,1,2-TCA	FTP-MW4-0319	0.8 ug/L	UJ	%R = 78 LCL=80 UCL=119	SD<LCL
1,1,2-Trichloro-1,2,2-trifluoroethane	JAW-80-0319	0.64 ug/L	J	MSRPD = 23.42 Limit =20	MSRPD
	JAW-80-0319	0.64 ug/L	J	%R = 76 LCL=78 UCL=123	SD<LCL
1,1-DCA	FTP-MW4-0319	0.8 ug/L	UJ	%R = 76 LCL=77 UCL=125	SD<LCL
1,1-DCE	FTP-MW4-0319	0.8 ug/L	UJ	%R = 70 LCL=71 UCL=131	SD<LCL
	JAW-80-0319	35 ug/L	J	%R = 138 LCL=71 UCL=131	MS>UCL
	JAW-80-0319	35 ug/L	J	MSRPD = 22.43 Limit =20	MSRPD
1,1-Dichloropropene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 76 LCL=79 UCL=125	SD<LCL

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8260B (WATER)					
1,1-Dichloropropene	JAW-80-0319	0.4 ug/L	UJ	MSRPD = 20.09 Limit =20	MSRPD
1,2-DCB	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=80 UCL=119	SD<LCL
1,2-Dibromoethane (EDB)	FTP-MW4-0319	0.4 ug/L	UJ	%R = 74 LCL=77 UCL=121	SD<LCL
1,3-DCB	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=80 UCL=119	SD<LCL
1,3-Dichloropropane	FTP-MW4-0319	0.2 ug/L	UJ	%R = 75 LCL=80 UCL=119	SD<LCL
1,4-DCB	FTP-MW4-0319	0.4 ug/L	UJ	%R = 72 LCL=79 UCL=118	SD<LCL
2-Chlorotoluene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 75 LCL=79 UCL=122	SD<LCL
4-Chlorotoluene	FTP-MW4-0319	0.8 ug/L	UJ	%R = 72 LCL=78 UCL=122	SD<LCL
Benzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 76 LCL=79 UCL=120	SD<LCL
Bromobenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 72 LCL=80 UCL=120	SD<LCL
Bromochloromethane	FTP-MW4-0319	0.2 ug/L	UJ	%R = 76 LCL=78 UCL=123	SD<LCL
Bromodichloromethane	FTP-MW4-0319	0.4 ug/L	UJ	%R = 78 LCL=79 UCL=125	SD<LCL
Bromoform	FTP-MW4-0319	1 ug/L	UJ	%R = 60 LCL=66 UCL=130	SD<LCL
Carbon disulfide	FTP-MW4-0319	0.8 ug/L	UJ	%R = 63 LCL=64 UCL=133	SD<LCL
	JAW-80-0319	0.8 ug/L	UJ	MSRPD = 22.92 Limit =20	MSRPD
	L3AP-MW1-0818	1.6 ug/L	UJ	%R = 58 LCL=64 UCL=133	MS<LCL
	L3AP-MW1-0818	1.6 ug/L	UJ	%R = 58 LCL=64 UCL=133	SD<LCL
Carbon tetrachloride	JAW-80-0319	0.4 ug/L	UJ	%R = 69 LCL=72 UCL=136	SD<LCL
Chlorobenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 75 LCL=82 UCL=118	SD<LCL
Chloroethane	JAW-80-0319	1.6 ug/L	UJ	MSRPD = 20.53 Limit =20	MSRPD
Chloroform	FTP-MW4-0319	0.4 ug/L	UJ	%R = 77 LCL=79 UCL=124	SD<LCL
Cis-1,2-DCE	FTP-MW4-0319	0.4 ug/L	UJ	%R = 76 LCL=78 UCL=123	SD<LCL
cis-1,3-Dichloropropene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 69 LCL=75 UCL=124	SD<LCL
Dibromochloromethane	FTP-MW4-0319	0.4 ug/L	UJ	%R = 64 LCL=74 UCL=126	SD<LCL
Dibromomethane	FTP-MW4-0319	0.4 ug/L	UJ	%R = 76 LCL=79 UCL=123	SD<LCL
Dichlorodifluoromethane	JAW-80-0319	0.8 ug/L	UJ	MSRPD = 22.75 Limit =20	MSRPD
Ethylbenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 74 LCL=79 UCL=121	SD<LCL
m,p-Xylene	FTP-MW4-0319	0.8 ug/L	UJ	%R = 74 LCL=80 UCL=121	SD<LCL

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8260B (WATER)					
n-Butylbenzene	FTP-MW4-0319	0.8 ug/L	UJ	%R = 73 LCL=75 UCL=128	SD<LCL
n-Propylbenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=76 UCL=126	SD<LCL
o-Xylene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 75 LCL=78 UCL=122	SD<LCL
p-Isopropyltoluene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 74 LCL=77 UCL=127	SD<LCL
sec-Butylbenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 72 LCL=77 UCL=126	SD<LCL
	JAW-80-0319	0.4 ug/L	UJ	MSRPD = 20.19 Limit =20	MSRPD
	JAW-80-0319	0.4 ug/L	UJ	%R = 75 LCL=77 UCL=126	SD<LCL
TCE	FTP-MW4-0319	0.4 ug/L	UJ	%R = 74 LCL=79 UCL=123	SD<LCL
tert-Butylbenzene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=78 UCL=124	SD<LCL
Toluene	FTP-MW4-0319	0.4 ug/L	UJ	%R = 78 LCL=80 UCL=121	SD<LCL
trans-1,2-DCE	FTP-MW4-0319	0.4 ug/L	UJ	%R = 73 LCL=75 UCL=124	SD<LCL
Trichlorofluoromethane	JAW-80-0319	0.8 ug/L	UJ	MSRPD = 22.52 Limit =20	MSRPD
Method (Matrix): SW8290 (WATER)					
1,2,3,4,6,7,8-Heptachlorodibenzofuran	JAW29-0418	0.72 pg/L	U		EMPC
	L9MW1-0418	0.46 pg/L	U		EMPC
	L9TTMW02-0418	1.8 pg/L	U		EMPC
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxi	JAW31-0418	1.1 pg/L	U		EMPC
	L9MW1-0418	0.85 pg/L	U		EMPC
1,2,3,4,7,8-Hexachlorodibenzofuran	JAW29-0418	0.28 pg/L	U		EMPC
	L9TTMW02-0418	1.6 pg/L	U		EMPC
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	L9TTMW02-0418	1.6 pg/L	U		EMPC
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	JAW29-0418	0.47 pg/L	U		EMPC
1,2,3,7,8,9-Hexachlorodibenzofuran	JAW31-0418	0.46 pg/L	U		EMPC
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	L9TTMW02-0418	0.47 pg/L	U		EMPC
2,3,7,8-Tetrachlorodibenzofuran	L9TTMW02-0418	2.2 pg/L	U		EMPC
2,3,7,8-Tetrachlorodibenzo-p-dioxin	JAW29-0418	2.3 pg/L	U		EMPC
	L9MW1-0418	2.3 pg/L	U		EMPC
Total HpCDD	JAW31-0418	2.3 pg/L	U		EMPC
	L9MW1-0418	2 pg/L	U		EMPC

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8290 (WATER)					
Total HpCDF	JAW29-0418	0.72 pg/L	U		EMPC
	L9MW1-0418	0.46 pg/L	U		EMPC
	L9TTMW02-0418	13 pg/L	U		EMPC
Total HxCDD	JAW29-0418	2.9 pg/L	U		EMPC
	L9TTMW02-0418	4.7 pg/L	U		EMPC
Total HxCDF	JAW29-0418	2.3 pg/L	U		EMPC
	JAW31-0418	0.46 pg/L	U		EMPC
	L9TTMW02-0418	20 pg/L	U		EMPC
Total PeCDF	L9TTMW02-0418	5.8 pg/L	U		EMPC
Total TCDD	JAW29-0418	2.3 pg/L	U		EMPC
	L9MW1-0418	2.3 pg/L	U		EMPC
Total TCDF	JAW31-0418	1.4 pg/L	U		EMPC
	L9MW1-0418	1 pg/L	U		EMPC
	L9TTMW02-0418	4.6 pg/L	U		EMPC
Method (Matrix): SW8330B (WATER)					
1,3,5-Trinitrobenzene	G-40-0518	0.05 ug/L	J	MSRPD = 31.17 Limit =20	MSRPD
	L3AP-MW1-0818	0.15 ug/L	J	%R = 66 LCL=73 UCL=125	MS<LCL
	L3AP-MW1-0818	0.15 ug/L	J	%R = 60 LCL=73 UCL=125	SD<LCL
	L800-G-58-0818	0.11 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-TTMW18-0818	0.1 ug/L	UJ	MSRPD = 20.44 Limit =20	MSRPD
1,3-Dinitrobenzene	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
2,4,6-Trinitrotoluene	5B-MW3-0718	0.099 ug/L	UJ	%R = 61 LCL=71 UCL=123	MS<LCL
	5B-MW3-0718	0.099 ug/L	UJ	%R = 65 LCL=71 UCL=123	SD<LCL
	L3AP-MW1-0818	0.1 ug/L	UJ	%R = 65 LCL=71 UCL=123	SD<LCL
	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
2,4-Dinitrotoluene	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
2,6-Dinitrotoluene	L3AP-MW1-0818	0.58 ug/L	J	%R = 39 LCL=77 UCL=127	MS<LCL
	L3AP-MW1-0818	0.58 ug/L	J	%R = 51 LCL=77 UCL=127	SD<LCL

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
2,6-Dinitrotoluene	L800-G-58-0818	0.058 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
2-Amino-4,6-dinitrotoluene	5B-MW3-0718	0.099 ug/L	UJ	%R = 76 LCL=79 UCL=120	MS<LCL
	5B-MW3-0718	0.099 ug/L	UJ	%R = 76 LCL=79 UCL=120	SD<LCL
	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
4-Amino-2,6-dinitrotoluene	JAW-52-1118	0.1 ug/L	UJ	%R = 65 LCL=76 UCL=125	MS<LCL
	JAW-52-1118	0.1 ug/L	UJ	MSRPD = 22.85 Limit =20	MSRPD
	L800-G-58-0818	0.33 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
hexahydro-1,3,5-trinitroso-1,3,5-triazine	L800-G-58-0818	0.28 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
hexahydro-1,3-dinitroso-5-nitro-1,3,5-tria	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.17 ug/L	J	narrative, possible false pos or neg	Matrix Interference
hexahydro-1-nitroso-3,5-dinitro-1,3,5-tria	L800-G-58-0818	6 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.82 ug/L	J	narrative, possible false pos or neg	Matrix Interference
HMX	5B-MW3-0718	0.099 ug/L	UJ	%R = 31 LCL=65 UCL=135	MS<LCL
	5B-MW3-0718	0.099 ug/L	UJ	%R = 30 LCL=65 UCL=135	SD<LCL
	EDA-2-0319	6 ug/L	J	%R = 170 LCL=65 UCL=135	MS>UCL
	EDA-2-0319	6 ug/L	J	%R = 164 LCL=65 UCL=135	SD>UCL
	L3AP-MW1-0818	1.3 ug/L	J	%R = -2 LCL=65 UCL=135	MS<LCL
	L3AP-MW1-0818	1.3 ug/L	J	%R = -5 LCL=65 UCL=135	SD<LCL
	L800-G-58-0818	57 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.12 ug/L	J	narrative, possible false pos or neg	Matrix Interference
m-Nitrotoluene	FTP-MW4-0319	0.39 ug/L	UJ	%R = 52 LCL=73 UCL=125	MS<LCL
	FTP-MW4-0319	0.39 ug/L	UJ	%R = 56 LCL=73 UCL=125	SD<LCL
	JAW-11-0319	0.4 ug/L	UJ	%R = 70 LCL=73 UCL=125	SD<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 51 LCL=73 UCL=125	MS<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 55 LCL=73 UCL=125	SD<LCL
	L3AP-MW1-0818	0.52 ug/L	J	%R = 57 LCL=73 UCL=125	MS<LCL
	L3AP-MW1-0818	0.52 ug/L	J	%R = 68 LCL=73 UCL=125	SD<LCL
	L800-G-58-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
Nitrobenzene	FTP-MW4-0319	0.19 ug/L	UJ	%R = 52 LCL=65 UCL=134	MS<LCL
	FTP-MW4-0319	0.19 ug/L	UJ	%R = 62 LCL=65 UCL=134	SD<LCL
	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
o-Nitrotoluene	FTP-MW4-0319	0.19 ug/L	UJ	%R = 39 LCL=70 UCL=127	MS<LCL
	FTP-MW4-0319	0.19 ug/L	UJ	%R = 47 LCL=70 UCL=127	SD<LCL
	JAW-11-0319	0.2 ug/L	UJ	%R = 66 LCL=70 UCL=127	SD<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 46 LCL=70 UCL=127	MS<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 49 LCL=70 UCL=127	SD<LCL
	L3AP-MW1-0818	0.32 ug/L	J	%R = 69 LCL=70 UCL=127	MS<LCL
	L3AP-MW1-0818	0.32 ug/L	J	%R = 67 LCL=70 UCL=127	SD<LCL
	L800-G-58-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
p-Nitrotoluene	FTP-MW4-0319	0.39 ug/L	UJ	%R = 62 LCL=71 UCL=127	MS<LCL
	FTP-MW4-0319	0.39 ug/L	UJ	%R = 65 LCL=71 UCL=127	SD<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 60 LCL=71 UCL=127	MS<LCL
	JAW-52-1118	0.2 ug/L	UJ	%R = 64 LCL=71 UCL=127	SD<LCL
	L3AP-MW1-0818	0.46 ug/L	J	%R = 54 LCL=71 UCL=127	MS<LCL
	L3AP-MW1-0818	0.46 ug/L	J	%R = 64 LCL=71 UCL=127	SD<LCL
	L800-G-58-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.2 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
RDX	L800-G-58-0818	410 ug/L	J	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-TTMW18-0818	1.3 ug/L	J	%R = 40 LCL=68 UCL=130	MS<LCL
Tetryl	5B-MW3-0718	0.099 ug/L	UJ	%R = 52 LCL=64 UCL=128	MS<LCL
	5B-MW3-0718	0.099 ug/L	UJ	%R = 52 LCL=64 UCL=128	SD<LCL
	L3AP-MW1-0818	0.1 ug/L	UJ	%R = 56 LCL=64 UCL=128	SD<LCL
	L800-G-58-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference
	L800-MW28-0818	0.1 ug/L	UJ	narrative, possible false pos or neg	Matrix Interference

TABLE 5

Matrix Spike Precision/Accuracy - Qualified Data

%D = percent difference
%R = percent recovery
LCL = lower control limit
UCL = upper control limit

mg/L = milligrams per liter
pg/L = Undefined Unit in tlkpUnits
UG/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J	=	The analyte was positively identified, the quantitation is an estimate.
U	=	The analyte was not detected in the analysis. The associated numerical value is at or below the method detection limit (MDL).
UJ	=	The analyte was not detected, the quantitation is an estimate.

Criteria:

Dissolved>Total	=	Dissolved metal result greater than the total metal result
EMPC	=	Estimated Maximum Possible Concentration
Matrix Interference	=	Matrix Interference
MS<LCL	=	Matrix spike recovery less than lower control limit
MS>UCL	=	Matrix spike recovery greater than upper control limit
MSRPD	=	Matrix spike RPD criteria exceedance
PDS	=	Post digestion spike failed
PDS<LCL	=	Post-Digestion Spike recovery less than the lower control limit
SD<LCL	=	Matrix spike duplicate recovery criteria less than lower control limit
SD>UCL	=	Matrix spike duplicate recovery criteria greater than upper control limit

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8082	SOIL		**Aroclor-1016**				
		CDL-SD8-0319		0.055 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1221**				
		CDL-SD8-0319		0.14 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1232**				
		CDL-SD8-0319		0.055 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1242**				
		CDL-SD8-0319		0.085 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1248**				
		CDL-SD8-0319		0.027 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1254**				
		CDL-SD8-0319		0.059 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8082	SOIL		**Aroclor-1260**				
		CDL-SD8-0319		0.012 mg/Kg	UJ	%R=56 LCL=59 UCL=130	Sur<LCL
SW8330B	WATER		**1,3,5-Trinitrobenzene**				
		5A-MW2-0718		0.069 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		0.19 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL

TABLE 6

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**1,3,5-Trinitrobenzene**				
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.41 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		59 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		0.11 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		1.3 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**1,3-Dinitrobenzene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**1,3-Dinitrobenzene**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		0.2 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		0.54 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		2.5 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
		WBP-TTMW-F11-0319		2.8 ug/L	J	%R = 498 LCL=83 UCL=119	Sur>UCL
SW8330B	WATER		**2,4,6-Trinitrotoluene**				
		5A-MW2-0718		0.68 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.26 ug/L	J	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**2,4,6-Trinitrotoluene**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.41 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		12 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		9.7 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**2,4-Dinitrotoluene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**2,4-Dinitrotoluene**				
		L800-G20-0818		4.5 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		3.2 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**2,6-Dinitrotoluene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.086 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		2.8 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		0.058 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**2,6-Dinitrotoluene**				
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		4.3 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.34 ug/L	J	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		1 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
		WBP-TTMW-F11-0319		0.82 ug/L	J	%R = 498 LCL=83 UCL=119	Sur>UCL
SW8330B	WATER		**2-Amino-4,6-dinitrotoluene**				
		5A-MW2-0718		6.9 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		2.9 ug/L	J	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		7.4 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.12 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		16 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**2-Amino-4,6-dinitrotoluene**				
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW27-0818		11 ug/L	J	%R=119 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		18 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		SA-99-1-0319		1.2 ug/L	J	%R=336 LCL=83 UCL=119	Sur>UCL
		WBP-99-6-0319		0.12 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.12 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**4-Amino-2,6-dinitrotoluene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		5.4 ug/L	J	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		7.3 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.12 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		7.9 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**4-Amino-2,6-dinitrotoluene**				
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		0.33 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL
		L800-MW27-0818		21 ug/L	J	%R=119 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		30 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		SA-99-1-0319		4.4 ug/L	J	%R=336 LCL=83 UCL=119	Sur>UCL
		WBP-MW1-0319		0.12 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)**				
		5A-MW2-0718		0.077 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		59 ug/L	J	%R = 3730 LCL = 79 UCL = 111	Sur>UCL
		GZ-3-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.2 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		1.7 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.24 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.2 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.2 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.23 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.2 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.2 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.14 ug/L	J	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.26 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)**				
		L3A-TW19-04B-5060-0419		0.1 ug/L	J	%R=169 LCL=83 UCL=119	Sur>UCL
		L800-G20-0818		48 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur<LCL
		L800-G-43-0818		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		0.28 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL
		L800-MW25-0818		25 ug/L	J	%R=112 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.2 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		110 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.27 ug/L	J	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		1.6 ug/L	J	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		20 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
		WBP-TTMW-F11-0319		23 ug/L	J	%R = 498 LCL=83 UCL=119	Sur>UCL
SW8330B	WATER		**hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)**				
		5A-MW2-0718		0.89 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		21 ug/L	J	%R = 3730 LCL = 79 UCL = 111	Sur>UCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		16 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		JAW-71-0818		2.1 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.88 ug/L	J	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.26 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		18 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.17 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		36 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.3 ug/L	J	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.25 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		23 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
SW8330B	WATER		**hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)**				
		5A-MW2-0718		1.2 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.41 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		110 ug/L	J	%R = 3730 LCL = 79 UCL = 111	Sur>UCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		3.3 ug/L	J	%R=432 LCL=79 UCL=111	Sur>UCL
		JAW-71-0818		0.31 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.098 ug/L	J	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		1 ug/L	J	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.3 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		19 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		6 ug/L	J	%R=116 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.82 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		43 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.29 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.28 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**HMX**				
		5A-MW2-0718		6.6 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		600 ug/L	J	%R=3872 LCL=79 UCL=111	Sur>UCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		160 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		JAW-71-0818		4.9 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.053 ug/L	J	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.16 ug/L	J	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.6 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**HMX**				
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		6.4 ug/L	J	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		620 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-G-58-0818		57 ug/L	J	%R=129 LCL=79 UCL=111	Sur>UCL
		L800-MW25-0818		13 ug/L	J	%R=112 LCL=79 UCL=111	Sur>UCL
		L800-MW27-0818		32 ug/L	J	%R=119 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.12 ug/L	J	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		190 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.084 ug/L	J	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**m-Nitrotoluene**				
		5B-DP2-0618		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.2 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.2 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.2 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.2 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.23 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.2 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.2 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**m-Nitrotoluene**				
		L2-MW9-0818		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.21 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.41 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		7.8 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.2 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		1.1 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.21 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**Nitrobenzene**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		14 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**Nitrobenzene**				
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L3AP-TW19-02-3545-0419		0.23 ug/L	J	%R=127 LCL=83 UCL=119	Sur>UCL
		L3A-TW19-02-1020-0419		0.14 ug/L	J	%R=120 LCL=83 UCL=119	Sur>UCL
		L800-G20-0818		0.2 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		3.4 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.43 ug/L	J	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**o-Nitrotoluene**				
		5B-DP2-0618		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.2 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.2 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.2 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.2 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.23 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.2 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.2 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.21 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**o-Nitrotoluene**				
		L800-G20-0818		0.41 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.2 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		1.1 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.21 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**p-Nitrotoluene**				
		5B-DP2-0618		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.2 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.2 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.2 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.2 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.2 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.2 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.23 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.2 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.2 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.2 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.21 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.39 ug/L	J	%R=77 LCL=83 UCL=119	Sur<LCL
		L3A-TW19-04B-5060-0419		0.27 ug/L	J	%R=169 LCL=83 UCL=119	Sur>UCL
		L800-G20-0818		0.41 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.21 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**p-Nitrotoluene**				
		L800-MW28-0818		0.2 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		1.1 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.21 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.2 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**RDX**				
		5A-MW2-0718		6.5 ug/L	J	%R = 0 LCL=79 UCL=111	Sur<LCL
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		3200 ug/L	J	%R=4111 LCL=79 UCL=111	Sur>UCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW70-0818		180 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		JAW-71-0818		2.4 ug/L	J	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.096 ug/L	J	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		1.1 ug/L	J	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		100 ug/L	J	%R=502 LCL=79 UCL=111	Sur>UCL
		L3A-MW5A-0818		2.6 ug/L	J	%R=121 LCL=79 UCL=111	Sur>UCL
		L3AP-TW19-01-3545-0419		0.41 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		6500 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**RDX**				
		L800-G-58-0818		410 ug/L	J	%R=134 LCL=79 UCL=111	Sur>UCL
		L800-MW25-0818		180 ug/L	J	%R=112 LCL=79 UCL=111	Sur>UCL
		L800-MW27-0818		300 ug/L	J	%R=161 LCL=79 UCL=111	Sur>UCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		630 ug/L	J	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		1.3 ug/L	J	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.086 ug/L	J	%R=71 LCL=79 UCL=111	Sur<LCL
		SA-99-1-0319		5.1 ug/L	J	%R=336 LCL=83 UCL=119	Sur>UCL
		WBP-99-6-0319		0.41 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.39 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
SW8330B	WATER		**Tetryl**				
		5B-DP2-0618		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		G-14-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		GZ-2-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		GZ-2A-1118		0.1 ug/L	UJ	%R= 2840 LCL=79 UCL=111	Sur<LCL
		GZ-3-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-40-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW-41-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		JAW42-1118		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		JAW-47-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		JAW-52-1118		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		JAW-71-0818		0.1 ug/L	UJ	%R=78 LCL=79 UCL=111	Sur<LCL
		L1-MW102-1118		0.1 ug/L	UJ	%R=65 LCL=79 UCL=111	Sur<LCL
		L1-MW104-1118		0.1 ug/L	UJ	%R=63 LCL=79 UCL=111	Sur<LCL
		L1-MW-105-1118		0.1 ug/L	UJ	%R=72 LCL=79 UCL=111	Sur<LCL
		L1-MW106-1118		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-100-1118		0.11 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L1-TTMW-101-1118		0.1 ug/L	UJ	%R=68 LCL=79 UCL=111	Sur<LCL
		L2-JAW-75-0818		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		L2-MW4-0818		0.1 ug/L	UJ	%R=75 LCL=79 UCL=111	Sur<LCL
		L2-MW9-0818		0.1 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L3A-JAW-18-0818		0.1 ug/L	UJ	%R=70 LCL=79 UCL=111	Sur<LCL
		L3AP-TW19-01-3545-0419		0.21 ug/L	UJ	%R=77 LCL=83 UCL=119	Sur<LCL
		L800-G20-0818		0.2 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL

TABLE **6**

Surrogate Recovery - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Surrogate Qualifier*	Surrogate Recovery	Criteria
SW8330B	WATER		**Tetryl**				
		L800-G-43-0818		0.11 ug/L	UJ	%R=73 LCL=79 UCL=111	Sur<LCL
		L800-MW28-0818		0.1 ug/L	UJ	%R=69 LCL=79 UCL=111	Sur<LCL
		L800-TTMW09-0818		0.54 ug/L	UJ	%R=0 LCL=79 UCL=111 DL	Sur>UCL
		L800-TTMW18-0818		0.1 ug/L	UJ	%R=74 LCL=79 UCL=111	Sur<LCL
		LI-MW107-1118		0.1 ug/L	UJ	%R=71 LCL=79 UCL=111	Sur<LCL
		WBP-99-6-0319		0.2 ug/L	UJ	%R = 81 LCL=83 UCL=119	Sur<LCL
		WBP-MW1-0319		0.2 ug/L	UJ	%R = 70 LCL=83 UCL=119	Sur<LCL
		WBP-TTMW-11-0319		1.7 ug/L	J	%R = 309 LCL=83 UCL=119	Sur>UCL
		WBP-TTMW-F11-0319		1.2 ug/L	J	%R = 498 LCL=83 UCL=119	Sur>UCL

%R = percent recovery
LCL = lower control limit
UCL = upper control limit

mg/Kg = milligrams per kilogram
ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.
UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

Sur<LCL = Surrogate recovery less than lower limit
Sur>UCL = Surrogate recovery greater than upper limit

TABLE 7

Internal Standards - Qualified Data

Sample Identification	Analyte	Result	Internal Standard Qualifier*	Criteria
Method (Matrix): SW8260B (WATER)				
FTP-MW6-R0319				
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.21 ug/L	J	IS<LCL
JAW-60-0319				
	1,1,1-TCA	12 ug/L	J	IS<LCL
	1,1,2-TCA	2.5 ug/L	J	IS<LCL
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.56 ug/L	J	IS<LCL
	1,1-DCA	140 ug/L	J	IS<LCL
	1,2-DCA	30 ug/L	J	IS<LCL
	Benzene	0.87 ug/L	J	IS<LCL
	Chloroethane	5.8 ug/L	J	IS<LCL
	Chloroform	1.8 ug/L	J	IS<LCL
	Cis-1,2-DCE	190 ug/L	J	IS<LCL
	TCE	37 ug/L	J	IS<LCL
	Tetrachloroethene	1.9 ug/L	J	IS<LCL
	trans-1,2-DCE	0.58 ug/L	J	IS<LCL
	Vinyl chloride	1.3 ug/L	J	IS<LCL
WBP-99-5-R0319				
	1,1,2-Trichloro-1,2,2-trifluoroethane	37000 ug/L	J	IS<LCL
	1,1-DCA	0.58 ug/L	J	IS<LCL
	1,2,4-Trimethylbenzene	2.7 ug/L	J	IS<LCL
	1,3,5-Trimethylbenzene	0.64 ug/L	J	IS<LCL
	Benzene	0.17 ug/L	J	IS<LCL
	Cis-1,2-DCE	0.87 ug/L	J	IS<LCL
	Ethylbenzene	0.7 ug/L	J	IS<LCL
	Isopropylbenzene	0.22 ug/L	J	IS<LCL
	m,p-Xylene	2.1 ug/L	J	IS<LCL
	MEK (2-Butanone)	8.1 ug/L	J	IS<LCL
	Naphthalene	3.2 ug/L	J	IS<LCL
	n-Butylbenzene	0.67 ug/L	J	IS<LCL
	n-Propylbenzene	0.28 ug/L	J	IS<LCL
	o-Xylene	1.7 ug/L	J	IS<LCL
	p-Isopropyltoluene	0.58 ug/L	J	IS<LCL
	sec-Butylbenzene	0.52 ug/L	J	IS<LCL
	TCE	0.77 ug/L	J	IS<LCL
	Toluene	6 ug/L	J	IS<LCL

TABLE 7

Internal Standards - Qualified Data

Sample Identification	Analyte	Result	Internal Standard Qualifier*	Criteria
Method (Matrix): SW8260B (WATER)				
WBP-99-6-0319				
	1,2,4-Trimethylbenzene	3.9 ug/L	J	IS<LCL
	1,3,5-Trimethylbenzene	1.3 ug/L	J	IS<LCL
	Benzene	0.47 ug/L	J	IS<LCL
	Bromomethane	1.3 ug/L	J	IS<LCL
	Carbon disulfide	68 ug/L	J	IS<LCL
	Ethylbenzene	1.9 ug/L	J	IS<LCL
	Isopropylbenzene	0.36 ug/L	J	IS<LCL
	m,p-Xylene	2.9 ug/L	J	IS<LCL
	Naphthalene	1.6 ug/L	J	IS<LCL
	n-Butylbenzene	0.93 ug/L	J	IS<LCL
	n-Propylbenzene	0.61 ug/L	J	IS<LCL
	o-Xylene	2.8 ug/L	J	IS<LCL
	p-Isopropyltoluene	0.7 ug/L	J	IS<LCL
	sec-Butylbenzene	0.69 ug/L	J	IS<LCL
	TCE	0.26 ug/L	J	IS<LCL
	Toluene	8.1 ug/L	J	IS<LCL
WBP-MW8-0319				
	1,1,2-Trichloro-1,2,2-trifluoroethane	8800 ug/L	J	IS<LCL
WBP-MW9-0319				
	1,2,4-Trimethylbenzene	1.9 ug/L	J	IS<LCL
	1,3,5-Trimethylbenzene	0.58 ug/L	J	IS<LCL
	1-Chlorohexane	0.31 ug/L	J	IS<LCL
	Chloroform	2.1 ug/L	J	IS<LCL
	Ethylbenzene	0.43 ug/L	J	IS<LCL
	m,p-Xylene	1.1 ug/L	J	IS<LCL
	Naphthalene	1.3 ug/L	J	IS<LCL
	n-Butylbenzene	0.8 ug/L	J	IS<LCL
	n-Propylbenzene	0.23 ug/L	J	IS<LCL
	o-Xylene	0.62 ug/L	J	IS<LCL
	p-Isopropyltoluene	0.56 ug/L	J	IS<LCL
	sec-Butylbenzene	0.49 ug/L	J	IS<LCL
	Toluene	1.2 ug/L	J	IS<LCL
WBP-TTMW-10-0319				

TABLE 7

Internal Standards - Qualified Data

Sample Identification	Analyte	Result	Internal Standard Qualifier*	Criteria
Method (Matrix): SW8260B (WATER)				
	1,1,2-Trichloro-1,2,2-trifluoroethane	540 ug/L	J	IS<LCL
WBP-TTMW-11-0319				
	1,1,1-TCA	0.61 ug/L	J	IS<LCL
	1,1-DCA	3.5 ug/L	J	IS<LCL
	Benzene	0.18 ug/L	J	IS<LCL
	Bromomethane	5.6 ug/L	J	IS<LCL
	Chloroform	0.51 ug/L	J	IS<LCL
	Chloromethane	4 ug/L	J	IS<LCL
	Cis-1,2-DCE	57 ug/L	J	IS<LCL
	TCE	54 ug/L	J	IS<LCL
	trans-1,2-DCE	0.5 ug/L	J	IS<LCL

ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

Criteria:

IS<LCL = Internal standard response less than lower control limit

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**1,3,5-Trinitrobenzene**			
		5A-MW2-0718		0.069 ug/L	J	CF>RPD
		JAW70-0818		0.19 ug/L	J	CF>RPD
		L3A-MW3B-0818		0.036 ug/L	J	CF>RPD
		L3AP-MW1-0818		0.15 ug/L	J	CF>RPD
		L3-DP1-2530-0718		0.2 ug/L	J	CF>RPD
		L3-DP2-1520-0718		0.035 ug/L	J	CF>RPD
		L800-MW14-0818		0.053 ug/L	J	CF>RPD
		L800-MW31-0818		0.19 ug/L	J	CF>RPD
SW8330B	WATER		**1,3-Dinitrobenzene**			
		CW-P-0618		0.056 ug/L	J	CF>RPD
		L3AP-MW1-0818		0.11 ug/L	J	CF>RPD
		L800-MW31-0818		7.6 ug/L	J	CF>RPD
		WBP-TTMW-11-0319		2.5 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		2.8 ug/L	J	CF>RPD
SW8330B	WATER		**2,4,6-Trinitrotoluene**			
		L2-JAW-75-0818		0.26 ug/L	J	CF>RPD
		L800-G20-0818		12 ug/L	J	CF>RPD
		L800-MW31-0818		7.6 ug/L	J	CF>RPD
SW8330B	WATER		**2,4-Dinitrotoluene**			
		L800-G20-0818		4.5 ug/L	J	CF>RPD
SW8330B	WATER		**2,6-Dinitrotoluene**			
		L3AP-MW1-0818		0.58 ug/L	J	CF>RPD
		L800-G20-0818		2.8 ug/L	J	CF>RPD
		L800-MW27-0818		0.88 ug/L	J	CF>RPD
		WBP-99-6-0319		0.34 ug/L	J	CF>RPD
		WBP-TTMW-11-0319		1 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		0.82 ug/L	J	CF>RPD
SW8330B	WATER		**2-Amino-4,6-dinitrotoluene**			
		L800-MW31-0818		2.2 ug/L	J	CF>RPD

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**2-Amino-4,6-dinitrotoluene**			
		WBP-99-2-0319		0.074 ug/L	J	CF>RPD
		WBP-TTMW-02-0319		0.51 ug/L	J	CF>RPD
		WBP-TTMW-06-0319		0.068 ug/L	J	CF>RPD
		WBP-TTMW-12-0319		0.43 ug/L	J	CF>RPD
		WBP-TTMW-14-0319		0.42 ug/L	J	CF>RPD
SW8330B	WATER		**4-Amino-2,6-dinitrotoluene**			
		JAW-23-0319		0.12 ug/L	J	CF>RPD
		JAW-25-0319		0.11 ug/L	J	CF>RPD
		JAW-25-0319		0.11 ug/L	J	CF>RPD
		PDS-MW3-0818		0.11 ug/L	J	CF>RPD
		SA-99-1-0319		4.4 ug/L	J	CF>RPD
		WBP-99-2-0319		0.23 ug/L	J	CF>RPD
		WBP-TTMW-02-0319		1.1 ug/L	J	CF>RPD
		WBP-TTMW-03-0319		0.26 ug/L	J	CF>RPD
		WBP-TTMW-12-0319		0.41 ug/L	J	CF>RPD
		WBP-TTMW-15-0319		0.51 ug/L	J	CF>RPD
SW8330B	WATER		**hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)**			
		5A-MW2-0718		0.077 ug/L	J	CF>RPD
		CCL-TTMW003-0818		0.06 ug/L	J	CF>RPD
		GZ-2A-1118		59 ug/L	J	CF>RPD
		L800-MW31-0818		0.49 ug/L	J	CF>RPD
		L800-TTMW18-0818		0.27 ug/L	J	CF>RPD
		WBP-99-2-0319		0.16 ug/L	J	CF>RPD
		WBP-99-6-0319		1.6 ug/L	J	CF>RPD
SW8330B	WATER		**hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)**			
		5A-MW2-0718		0.89 ug/L	J	CF>RPD
		CTATW003-0618		0.47 ug/L	J	CF>RPD
		JAW-17-0818		0.74 ug/L	J	CF>RPD
		JAW-23-0319		0.76 ug/L	J	CF>RPD

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)**			
		JAW-24-0319		0.18 ug/L	J	CF>RPD
		JAW70-0818		16 ug/L	J	CF>RPD
		JAW-71-0818		2.1 ug/L	J	CF>RPD
		L1-MW103-0319		0.84 ug/L	J	CF>RPD
		L3A-JAW-18-0818		0.88 ug/L	J	CF>RPD
		L3A-MW4A-0818		0.058 ug/L	J	CF>RPD
		L3AP-MW1-0818		0.08 ug/L	J	CF>RPD
		L3AP-MW3-0818		0.17 ug/L	J	CF>RPD
		L3AP-MW4-0818		0.068 ug/L	J	CF>RPD
		L800-MW1-0818		0.083 ug/L	J	CF>RPD
		L800-MW14-0818		0.1 ug/L	J	CF>RPD
		L800-MW27-0818		3.6 ug/L	J	CF>RPD
		L800-MW31-0818		0.11 ug/L	UJ	CF>RPD
		WBP-99-6-0319		0.3 ug/L	J	CF>RPD
		WBP-TTMW-02-0319		4.7 ug/L	J	CF>RPD
		WBP-TTMW-03-0319		0.43 ug/L	J	CF>RPD
		WBP-TTMW-06-0319		0.33 ug/L	J	CF>RPD
		WBP-TTMW-11-0319		23 ug/L	J	CF>RPD
		WBP-TTMW-12-0319		0.39 ug/L	J	CF>RPD
		WBP-TTMW-14-0319		0.33 ug/L	J	CF>RPD
		WBP-TTMW-15-0319		0.14 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		36 ug/L	J	CF>RPD
SW8330B	WATER		**hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)**			
		5B-DP2-0618		0.41 ug/L	J	CF>RPD
		JAW-25-0319		0.74 ug/L	J	CF>RPD
		NBP-MW1-0319		0.1 ug/L	J	CF>RPD
		WBP-99-1-0319		0.24 ug/L	J	CF>RPD
		WBP-TTMW-11-0319		30 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		33 ug/L	J	CF>RPD

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**HMX**			
		CCL-TTMW001-0818		8.4 ug/L	J	CF>RPD
		FTA-TT-MW-05-0319		0.43 ug/L	J	CF>RPD
		FTA-TT-MW-F05-0319		0.45 ug/L	J	CF>RPD
		JAW-11-0319		0.088 ug/L	J	CF>RPD
		JAW-20-0818		0.038 ug/L	J	CF>RPD
		JAW-59-0319		0.24 ug/L	J	CF>RPD
		L3AP-MW1-0818		1.3 ug/L	J	CF>RPD
		L3-DP1-2530-0718		0.2 ug/L	J	CF>RPD
		L800-MW14-0818		0.17 ug/L	J	CF>RPD
		L800-MW28-0818		0.12 ug/L	J	CF>RPD
		L800-MW31-0818		1.3 ug/L	J	CF>RPD
		WBP-99-1-0319		0.86 ug/L	J	CF>RPD
		WBP-99-4-0319		13 ug/L	J	CF>RPD
		WBP-TTMW-04-0319		0.55 ug/L	J	CF>RPD
SW8330B	WATER		**m-Nitrotoluene**			
		L3AP-MW1-0818		0.52 ug/L	J	CF>RPD
		L3AP-MW3-0818		0.18 ug/L	J	CF>RPD
		L800-G20-0818		7.8 ug/L	J	CF>RPD
		L800-MW27-0818		1.4 ug/L	J	CF>RPD
SW8330B	WATER		**Nitrobenzene**			
		JAW70-0818		14 ug/L	J	CF>RPD
		L3AP-TW19-02-3545-0419		0.23 ug/L	J	CF>RPD
		L3AP-TW19-03-3545-0419		0.21 ug/L	J	CF>RPD
		L3A-TW19-02-1020-0419		0.14 ug/L	J	CF>RPD
		L800-TTMW18-0818		0.43 ug/L	J	CF>RPD
SW8330B	WATER		**o-Nitrotoluene**			
		L3AP-MW1-0818		0.32 ug/L	J	CF>RPD
		L3AP-MW3-0818		0.46 ug/L	J	CF>RPD
SW8330B	WATER		**p-Nitrotoluene**			

TABLE 8

Confirmation Analysis - Qualified Data

Method	Matrix	Sample Identification	Analyte	Result	Confirmation Qualifier*	Criteria
SW8330B	WATER		**p-Nitrotoluene**			
		L3AP-MW1-0818		0.46 ug/L	J	CF>RPD
		L3A-TW19-04B-5060-0419		0.27 ug/L	J	CF>RPD
SW8330B	WATER		**RDX**			
		FTA-99-1-0319		0.36 ug/L	J	CF>RPD
		L1-MW102-1118		0.096 ug/L	J	CF>RPD
		L3A-MW5B-0818		0.13 ug/L	J	CF>RPD
		L3AP-MW1-0818		0.076 ug/L	J	CF>RPD
		LI-MW107-1118		0.086 ug/L	J	CF>RPD
SW8330B	WATER		**Tetryl**			
		CCL-TTMW002-0818		0.35 ug/L	J	CF>RPD
		L3A-MW6A-0818		0.16 ug/L	J	CF>RPD
		WBP-TTMW-F11-0319		1.2 ug/L	J	CF>RPD

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

CF>RPD = Confirmation Precision Exceeded

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
1,1,1,2-Tetrachloroethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,1,1-TCA					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	7.5 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	23 ug/L	J	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.5 ug/L	J	SI	
	JAW-60-0319	12 ug/L	J	SI	
	JAW-80-0319	6.6 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.43 ug/L	J	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.61 ug/L	J	SI	
	WBP-TTMW-F11-0319	0.65 ug/L	J	SI	
1,1,2,2-Tetrachloroethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,1,2-TCA					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	J	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	2.5 ug/L	J	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,1,2-Trichloro-1,2,2-trifluoroethane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	FTP-MW6-R0319	0.21 ug/L	U	TB<RL	blank target = 3.55 ug/L
	G-30-R0319	0.4 ug/L	U	TB<RL	blank target = 3.55 ug/L
	JAW-23-0319	6.1 ug/L	J	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.56 ug/L	J	SI	
	JAW-80-0319	0.64 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	4 ug/L	J	SI	
	WBP-MW1-0319	0.4 ug/L	U	TB<RL	blank target = 3.55 ug/L
	WBP-MW2-0319	0.84 ug/L	J	SI	
	WBP-TTMW-05B-0319	0.4 ug/L	U	TB<RL	blank target = 3.55 ug/L
1,1-DCA					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	6.5 ug/L	J	SI	
	FTA-TT-MW-01-0319	3.1 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.71 ug/L	J	SI	
	FTA-TT-MW-F05-0319	0.68 ug/L	J	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.72 ug/L	J	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	140 ug/L	J	SI	
	JAW-80-0319	6 ug/L	J	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.58 ug/L	J	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	1 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	3.5 ug/L	J	SI	
	WBP-TTMW-F11-0319	3.3 ug/L	J	SI	
1,1-DCE					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	39 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	55 ug/L	J	SI	

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	1.4 ug/L	J	SI	
	JAW-80-0319	35 ug/L	J	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	47 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,1-Dichloropropene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2,3-Trichlorobenzene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,2,3-Trichloropropane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,2,4-Trichlorobenzene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
1,2,4-Trimethylbenzene					

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.33 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	2.7 ug/L	J	SI	
	WBP-99-6-0319	3.9 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	1.9 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2-DCA					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	1.6 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	30 ug/L	J	SI	
	JAW-80-0319	1.4 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-1-0319	0.4 ug/L	U	EB<RL	blank target = 0.16 ug/L
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2-DCB					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2-Dibromo-3-chloropropane					
	EBP-MW13-R0319	1.6 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	1.6 ug/L	UJ	SI	
	FTP-MW4-0319	1.6 ug/L	UJ	SI	
	FTP-MW5-R0319	1.6 ug/L	UJ	SI	
	JAW-23-0319	1.6 ug/L	UJ	SI	
	JAW-58-0319	1.6 ug/L	UJ	SI	
	JAW-60-0319	1.6 ug/L	UJ	SI	
	JAW-80-0319	1.6 ug/L	UJ	SI	
	M-01-0319	1.6 ug/L	UJ	SI	
	WBP-99-5-R0319	1.6 ug/L	UJ	SI	
	WBP-99-6-0319	1.6 ug/L	UJ	SI	
	WBP-MW2-0319	1.6 ug/L	UJ	SI	
	WBP-MW3-0319	1.6 ug/L	UJ	SI	
	WBP-MW9-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-06-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-10-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-11-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	1.6 ug/L	UJ	SI	
1,2-Dibromoethane (EDB)					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,2-Dichloropropane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,3,5-Trimethylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.64 ug/L	J	SI	
	WBP-99-6-0319	1.3 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.58 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,3-DCB					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1,3-Dichloropropane					
	EBP-MW13-R0319	0.2 ug/L	UJ	SI	
	FJAW-80-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.2 ug/L	UJ	SI	
	FTP-MW4-0319	0.2 ug/L	UJ	SI	
	FTP-MW5-R0319	0.2 ug/L	UJ	SI	
	JAW-23-0319	0.2 ug/L	UJ	SI	
	JAW-58-0319	0.2 ug/L	UJ	SI	
	JAW-60-0319	0.2 ug/L	UJ	SI	
	JAW-80-0319	0.2 ug/L	UJ	SI	
	M-01-0319	0.2 ug/L	UJ	SI	
	WBP-99-5-R0319	0.2 ug/L	UJ	SI	
	WBP-99-6-0319	0.2 ug/L	UJ	SI	
	WBP-MW2-0319	0.2 ug/L	UJ	SI	
	WBP-MW3-0319	0.2 ug/L	UJ	SI	
	WBP-MW9-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.2 ug/L	UJ	SI	
1,4-DCB					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
1-Chlorohexane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.31 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
2,2-Dichloropropane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
2-Chlorotoluene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
2-Hexanone					
	EBP-MW13-R0319	4 ug/L	UJ	SI	
	FJAW-80-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	4 ug/L	UJ	SI	
	FTP-MW4-0319	4 ug/L	UJ	SI	
	FTP-MW5-R0319	4 ug/L	UJ	SI	
	JAW-23-0319	4 ug/L	UJ	SI	
	JAW-58-0319	4 ug/L	UJ	SI	
	JAW-60-0319	4 ug/L	UJ	SI	
	JAW-80-0319	4 ug/L	UJ	SI	
	M-01-0319	4 ug/L	UJ	SI	
	WBP-99-5-R0319	4 ug/L	UJ	SI	
	WBP-99-6-0319	4 ug/L	UJ	SI	
	WBP-MW2-0319	4 ug/L	UJ	SI	
	WBP-MW3-0319	4 ug/L	UJ	SI	
	WBP-MW9-0319	4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-11-0319	4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	4 ug/L	UJ	SI	
4-Chlorotoluene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Acetone					
	EBP-MW13-R0319	2.7 ug/L	J	SI	
	FJAW-80-0319	6.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	6.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	6.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	6.4 ug/L	UJ	SI	
	FTP-MW4-0319	6.4 ug/L	UJ	SI	
	FTP-MW5-R0319	6.4 ug/L	UJ	SI	
	JAW-23-0319	6.4 ug/L	UJ	SI	
	JAW-58-0319	6.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-60-0319	6.4 ug/L	UJ	SI	
	JAW-80-0319	6.4 ug/L	UJ	SI	
	M-01-0319	6.4 ug/L	UJ	SI	
	WBP-99-5-R0319	6.4 ug/L	UJ	SI	
	WBP-99-6-0319	6.4 ug/L	UJ	SI	
	WBP-MW2-0319	6.4 ug/L	UJ	SI	
	WBP-MW3-0319	6.4 ug/L	UJ	SI	
	WBP-MW9-0319	6.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	380 ug/L	J	SI	
	WBP-TTMW-10-0319	6.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	6.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	6.4 ug/L	UJ	SI	
Benzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	4.9 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.98 ug/L	J	SI	
	FTA-TT-MW-F05-0319	0.92 ug/L	J	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.87 ug/L	J	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.17 ug/L	J	SI	
	WBP-99-6-0319	0.47 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.18 ug/L	J	SI	
	WBP-TTMW-F11-0319	0.19 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
Bromobenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Bromochloromethane					
	EBP-MW13-R0319	0.2 ug/L	UJ	SI	
	FJAW-80-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.2 ug/L	UJ	SI	
	FTP-MW4-0319	0.2 ug/L	UJ	SI	
	FTP-MW5-R0319	0.2 ug/L	UJ	SI	
	JAW-23-0319	0.2 ug/L	UJ	SI	
	JAW-58-0319	0.2 ug/L	UJ	SI	
	JAW-60-0319	0.2 ug/L	UJ	SI	
	JAW-80-0319	0.2 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	0.2 ug/L	UJ	SI	
	WBP-99-5-R0319	0.2 ug/L	UJ	SI	
	WBP-99-6-0319	0.2 ug/L	UJ	SI	
	WBP-MW2-0319	0.2 ug/L	UJ	SI	
	WBP-MW3-0319	0.2 ug/L	UJ	SI	
	WBP-MW9-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.2 ug/L	UJ	SI	
Bromodichloromethane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Bromoform					
	EBP-MW13-R0319	1 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	1 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	1 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	1 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	1 ug/L	UJ	SI	
	FTP-MW4-0319	1 ug/L	UJ	SI	
	FTP-MW5-R0319	1 ug/L	UJ	SI	
	JAW-23-0319	1 ug/L	UJ	SI	
	JAW-58-0319	1 ug/L	UJ	SI	
	JAW-60-0319	1 ug/L	UJ	SI	
	JAW-80-0319	1 ug/L	UJ	SI	
	M-01-0319	1 ug/L	UJ	SI	
	WBP-99-5-R0319	1 ug/L	UJ	SI	
	WBP-99-6-0319	1 ug/L	UJ	SI	
	WBP-MW2-0319	1 ug/L	UJ	SI	
	WBP-MW3-0319	1 ug/L	UJ	SI	
	WBP-MW9-0319	1 ug/L	UJ	SI	
	WBP-TTMW-06-0319	1 ug/L	UJ	SI	
	WBP-TTMW-10-0319	1 ug/L	UJ	SI	
	WBP-TTMW-11-0319	1 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	1 ug/L	UJ	SI	
Bromomethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-6-0319	1.3 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	3.8 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	5.6 ug/L	J	SI	
	WBP-TTMW-F11-0319	8.4 ug/L	J	SI	
Carbon disulfide					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	68 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.21 ug/L	J	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Carbon tetrachloride					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Chlorobenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Chloroethane					
	EBP-MW13-R0319	1.6 ug/L	UJ	SI	
	FJAW-80-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	2.5 ug/L	J	SI	
	FTA-TT-MW-05-0319	1.6 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	1.6 ug/L	UJ	SI	
	FTP-MW4-0319	1.6 ug/L	UJ	SI	
	FTP-MW5-R0319	1.6 ug/L	UJ	SI	
	JAW-23-0319	1.6 ug/L	UJ	SI	
	JAW-58-0319	1.6 ug/L	UJ	SI	
	JAW-60-0319	5.8 ug/L	J	SI	
	JAW-80-0319	1.6 ug/L	UJ	SI	
	M-01-0319	1.6 ug/L	UJ	SI	
	WBP-99-5-R0319	1.6 ug/L	UJ	SI	
	WBP-99-6-0319	1.6 ug/L	UJ	SI	
	WBP-MW2-0319	1.6 ug/L	UJ	SI	
	WBP-MW3-0319	1.6 ug/L	UJ	SI	
	WBP-MW9-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-06-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-10-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-11-0319	1.6 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	1.6 ug/L	UJ	SI	
Chloroform					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.35 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-02-0319	6.6 ug/L	U	EB>RL	blank target = 2.3 ug/L
	FTA-TT-MW-03-0319	20 ug/L	U	EB>RL	blank target = 2.3 ug/L

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-59-0319	0.4 ug/L	U	EB>RL	blank target = 3.6 ug/L
	JAW-60-0319	1.8 ug/L	U	EB>RL	blank target = 2.3 ug/L
	JAW-60-0319	1.8 ug/L	J	SI	
	JAW-61-0319	0.4 ug/L	U	EB>RL	blank target = 2.3 ug/L
	JAW-80-0319	0.29 ug/L	U	EB>RL	blank target = 3.6 ug/L
	JAW-80-0319	0.29 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	SA-99-1-0319	1.9 ug/L	U	EB>RL	blank target = 2.3 ug/L
	WBP-99-1-0319	0.4 ug/L	U	EB>RL	blank target = 3.6 ug/L
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	2.1 ug/L	J	SI	
	WBP-TTMW-01-0319	8 ug/L	U	EB>RL	blank target = 3.6 ug/L
	WBP-TTMW-02-0319	16 ug/L	U	EB>RL	blank target = 3.6 ug/L
	WBP-TTMW-06-0319	0.33 ug/L	J	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.51 ug/L	J	SI	
	WBP-TTMW-F11-0319	0.51 ug/L	J	SI	
Chloromethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	2.9 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	4 ug/L	J	SI	
	WBP-TTMW-F11-0319	6.2 ug/L	J	SI	
Cis-1,2-DCE					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	6.3 ug/L	J	SI	
	FTA-TT-MW-01-0319	1 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	190 ug/L	J	SI	
	JAW-80-0319	5.9 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.87 ug/L	J	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	9.6 ug/L	J	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-11-0319	57 ug/L	J	SI	
	WBP-TTMW-F11-0319	56 ug/L	J	SI	
cis-1,3-Dichloropropene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Dibromochloromethane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Dibromomethane					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
Dichlorodifluoromethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.33 ug/L	J	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	69 ug/L	J	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Ethylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	1.4 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.31 ug/L	J	SI	
	FTA-TT-MW-F05-0319	0.27 ug/L	J	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.7 ug/L	J	SI	
	WBP-99-6-0319	1.9 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.43 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Hexachlorobutadiene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Isopropylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.22 ug/L	J	SI	
	WBP-99-6-0319	0.36 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
m,p-Xylene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.19 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	2.1 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-6-0319	2.9 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	1.1 ug/L	J	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
MEK (2-Butanone)					
	EBP-MW13-R0319	4 ug/L	UJ	SI	
	FJAW-80-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	4 ug/L	UJ	SI	
	FTP-MW4-0319	4 ug/L	UJ	SI	
	FTP-MW5-R0319	4 ug/L	UJ	SI	
	JAW-23-0319	4 ug/L	UJ	SI	
	JAW-58-0319	4 ug/L	UJ	SI	
	JAW-60-0319	4 ug/L	UJ	SI	
	JAW-80-0319	4 ug/L	UJ	SI	
	M-01-0319	4 ug/L	UJ	SI	
	WBP-99-5-R0319	8.1 ug/L	J	SI	
	WBP-99-6-0319	4 ug/L	UJ	SI	
	WBP-MW2-0319	4 ug/L	UJ	SI	
	WBP-MW3-0319	4 ug/L	UJ	SI	
	WBP-MW9-0319	4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	4 ug/L	UJ	SI	
Methyl tert-butyl ether (MTBE)					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Methylene chloride					
	EBP-MW13-R0319	2 ug/L	UJ	SI	
	FJAW-80-0319	2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	2 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	2 ug/L	UJ	SI	
	FTP-MW4-0319	2 ug/L	UJ	SI	
	FTP-MW5-R0319	2 ug/L	UJ	SI	
	JAW-23-0319	2 ug/L	UJ	SI	
	JAW-58-0319	2 ug/L	UJ	SI	
	JAW-60-0319	2 ug/L	UJ	SI	
	JAW-80-0319	2 ug/L	UJ	SI	
	L3AP-FMW4-0818	0.78 ug/L	U	EB<RL	
	L3AP-MW4-0818	0.59 ug/L	U	EB<RL	
	M-01-0319	2 ug/L	UJ	SI	
	WBP-99-5-R0319	2 ug/L	UJ	SI	

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-99-6-0319	2 ug/L	UJ	SI	
	WBP-MW2-0319	2 ug/L	UJ	SI	
	WBP-MW3-0319	2 ug/L	UJ	SI	
	WBP-MW9-0319	2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	2 ug/L	UJ	SI	
MIBK (Methyl isobutyl ketone)					
	EBP-MW13-R0319	3.2 ug/L	UJ	SI	
	FJAW-80-0319	3.2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	3.2 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	3.2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	3.2 ug/L	UJ	SI	
	FTP-MW4-0319	3.2 ug/L	UJ	SI	
	FTP-MW5-R0319	3.2 ug/L	UJ	SI	
	JAW-23-0319	3.2 ug/L	UJ	SI	
	JAW-58-0319	3.2 ug/L	UJ	SI	
	JAW-60-0319	3.2 ug/L	UJ	SI	
	JAW-80-0319	3.2 ug/L	UJ	SI	
	M-01-0319	3.2 ug/L	UJ	SI	
	WBP-99-5-R0319	3.2 ug/L	UJ	SI	
	WBP-99-6-0319	3.2 ug/L	UJ	SI	
	WBP-MW2-0319	3.2 ug/L	UJ	SI	
	WBP-MW3-0319	3.2 ug/L	UJ	SI	
	WBP-MW9-0319	3.2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	3.2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	3.2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	3.2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	3.2 ug/L	UJ	SI	
Naphthalene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	3.2 ug/L	J	SI	
	WBP-99-6-0319	1.6 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	1.3 ug/L	J	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
n-Butylbenzene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.67 ug/L	J	SI	
	WBP-99-6-0319	0.93 ug/L	J	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	J	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
n-Propylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.22 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.28 ug/L	J	SI	
	WBP-99-6-0319	0.61 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.23 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
o-Xylene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	1.7 ug/L	J	SI	
	WBP-99-6-0319	2.8 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.62 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
p-Isopropyltoluene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.58 ug/L	J	SI	
	WBP-99-6-0319	0.7 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.56 ug/L	J	SI	

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
sec-Butylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.17 ug/L	J	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.52 ug/L	J	SI	
	WBP-99-6-0319	0.69 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.49 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Styrene					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
TCE					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	2.8 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.17 ug/L	J	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	37 ug/L	J	SI	
	JAW-80-0319	2.5 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.77 ug/L	J	SI	
	WBP-99-6-0319	0.26 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	13 ug/L	J	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	WBP-TTMW-11-0319	54 ug/L	J	SI	
	WBP-TTMW-F11-0319	53 ug/L	J	SI	
tert-Butylbenzene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Tetrachloroethene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.81 ug/L	J	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.64 ug/L	J	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.38 ug/L	J	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	JAW-60-0319	1.9 ug/L	J	SI	
	JAW-80-0319	0.75 ug/L	J	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Toluene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.18 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	6 ug/L	J	SI	
	WBP-99-6-0319	8.1 ug/L	J	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	1.2 ug/L	J	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
trans-1,2-DCE					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.58 ug/L	J	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.5 ug/L	J	SI	
	WBP-TTMW-F11-0319	0.5 ug/L	J	SI	
trans-1,3-Dichloropropene					
	EBP-MW13-R0319	0.4 ug/L	UJ	SI	
	FJAW-80-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.4 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.4 ug/L	UJ	SI	
	FTP-MW4-0319	0.4 ug/L	UJ	SI	
	FTP-MW5-R0319	0.4 ug/L	UJ	SI	
	JAW-23-0319	0.4 ug/L	UJ	SI	
	JAW-58-0319	0.4 ug/L	UJ	SI	
	JAW-60-0319	0.4 ug/L	UJ	SI	
	JAW-80-0319	0.4 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	M-01-0319	0.4 ug/L	UJ	SI	
	WBP-99-5-R0319	0.4 ug/L	UJ	SI	
	WBP-99-6-0319	0.4 ug/L	UJ	SI	
	WBP-MW2-0319	0.4 ug/L	UJ	SI	
	WBP-MW3-0319	0.4 ug/L	UJ	SI	
	WBP-MW9-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.4 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.4 ug/L	UJ	SI	
Trichlorofluoromethane					
	EBP-MW13-R0319	0.8 ug/L	UJ	SI	
	FJAW-80-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-05-0319	0.8 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.8 ug/L	UJ	SI	
	FTP-MW4-0319	0.8 ug/L	UJ	SI	
	FTP-MW5-R0319	0.8 ug/L	UJ	SI	
	JAW-23-0319	0.8 ug/L	UJ	SI	
	JAW-58-0319	0.8 ug/L	UJ	SI	
	JAW-60-0319	0.8 ug/L	UJ	SI	
	JAW-80-0319	0.8 ug/L	UJ	SI	
	M-01-0319	0.8 ug/L	UJ	SI	
	WBP-99-5-R0319	0.8 ug/L	UJ	SI	
	WBP-99-6-0319	0.8 ug/L	UJ	SI	
	WBP-MW2-0319	0.8 ug/L	UJ	SI	
	WBP-MW3-0319	0.8 ug/L	UJ	SI	
	WBP-MW9-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.8 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.8 ug/L	UJ	SI	
Vinyl chloride					
	EBP-MW13-R0319	0.2 ug/L	UJ	SI	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8260B (WATER)					
	FJAW-80-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-01-0319	0.24 ug/L	J	SI	
	FTA-TT-MW-05-0319	0.2 ug/L	UJ	SI	
	FTA-TT-MW-F05-0319	0.2 ug/L	UJ	SI	
	FTP-MW4-0319	0.2 ug/L	UJ	SI	
	FTP-MW5-R0319	0.2 ug/L	UJ	SI	
	JAW-23-0319	0.2 ug/L	UJ	SI	
	JAW-58-0319	0.2 ug/L	UJ	SI	
	JAW-60-0319	1.3 ug/L	J	SI	
	JAW-80-0319	0.2 ug/L	UJ	SI	
	M-01-0319	0.2 ug/L	UJ	SI	
	WBP-99-5-R0319	0.2 ug/L	UJ	SI	
	WBP-99-6-0319	0.2 ug/L	UJ	SI	
	WBP-MW2-0319	0.2 ug/L	UJ	SI	
	WBP-MW3-0319	0.2 ug/L	UJ	SI	
	WBP-MW9-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-06-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-10-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-11-0319	0.2 ug/L	UJ	SI	
	WBP-TTMW-F11-0319	0.2 ug/L	UJ	SI	
Method (Matrix): SW8290 (WATER)					
1,2,3,4,6,7,8,9-Octachlorodibenzofura					
	JAW29-0418	1.8 pg/L	U	LB<RL	
	L9TTMW02-0418	2.8 pg/L	U	LB<RL	
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-d					
	JAW29-0418	9.5 pg/L	U	LB<RL	
	JAW31-0418	3.1 pg/L	U	LB<1/2RL	blank target = 2.89pg/L
	L9MW1-0418	7.1 pg/L	U	LB<RL	
	L9TTMW02-0418	23 pg/L	U	LB<RL	
1,2,3,4,6,7,8-Heptachlorodibenzofura					
	JAW29-0418	0.72 pg/L	U	LB<RL	
	L9MW1-0418	0.46 pg/L	U	LB<RL	
	L9TTMW02-0418	1.8 pg/L	U	LB<RL	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-di					

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8290 (WATER)					
	JAW29-0418	1.6 pg/L	U	LB<RL	
	L9MW1-0418	0.85 pg/L	U	LB<RL	
	L9TTMW02-0418	3.3 pg/L	U	LB<RL	
1,2,3,4,7,8,9-Heptachlorodibenzofura					
	L9TTMW02-0418	8.1 pg/L	U	LB<RL	
1,2,3,4,7,8-Hexachlorodibenzofuran					
	L9TTMW02-0418	1.6 pg/L	U	LB<RL	
1,2,3,4,7,8-Hexachlorodibenzo-p-diox					
	JAW29-0418	1.7 pg/L	U	LB<RL	
	JAW31-0418	2 pg/L	U	LB<1/2RL	blank target = 1.87pg/L
	L9MW1-0418	1.5 pg/L	U	LB<RL	
	L9TTMW02-0418	1.6 pg/L	U	LB<RL	
1,2,3,6,7,8-Hexachlorodibenzofuran					
	L9TTMW02-0418	0.91 pg/L	U	LB<RL	
1,2,3,7,8,9-Hexachlorodibenzofuran					
	JAW29-0418	0.97 pg/L	U	LB<RL	
	L9MW1-0418	0.83 pg/L	U	LB<RL	
	L9TTMW02-0418	10 pg/L	U	LB<RL	
1,2,3,7,8-Pentachlorodibenzofuran					
	L9TTMW02-0418	3.1 pg/L	U	LB<RL	
2,3,7,8-Tetrachlorodibenzo-p-dioxin					
	JAW29-0418	2.3 pg/L	U	LB<RL	
	L9MW1-0418	2.3 pg/L	U	LB<RL	
Total HpCDD					
	JAW29-0418	3.1 pg/L	U	LB<RL	
	JAW31-0418	2.3 pg/L	U	LB<1/2RL	blank target = 0.846pg/L
	L9MW1-0418	2 pg/L	U	LB<RL	
	L9TTMW02-0418	5.9 pg/L	U	LB<RL	
Total HpCDF					
	JAW29-0418	0.72 pg/L	U	LB<RL	
	L9MW1-0418	0.46 pg/L	U	LB<RL	
	L9TTMW02-0418	13 pg/L	U	LB<RL	
Total HxCDD					

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8290 (WATER)					
	JAW29-0418	2.9 pg/L	U	LB<RL	
	JAW31-0418	2 pg/L	U	LB<1/2RL	blank target = 1.87pg/L
	L9MW1-0418	1.5 pg/L	U	LB<RL	
	L9TTMW02-0418	4.7 pg/L	U	LB<RL	
Total HxCDF					
	JAW29-0418	2.3 pg/L	U	LB<RL	
	L9MW1-0418	0.83 pg/L	U	LB<RL	
	L9TTMW02-0418	20 pg/L	U	LB<RL	
Total PeCDF					
	L9TTMW02-0418	5.8 pg/L	U	LB<RL	
Total TCDD					
	JAW29-0418	2.3 pg/L	U	LB<RL	
	L9MW1-0418	2.3 pg/L	U	LB<RL	
Total TCDF					
	JAW29-0418	1.7 pg/L	U	LB<RL	
	L9MW1-0418	1 pg/L	U	LB<RL	
	L9TTMW02-0418	4.6 pg/L	U	LB<RL	
Method (Matrix): SW8330B (WATER)					
1,3,5-Trinitrobenzene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.2 ug/L	J	TEMP>6C	
	L3-DP2-1520-0718	0.035 ug/L	J	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
1,3-Dinitrobenzene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
2,4,6-Trinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8330B (WATER)					
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
2,4-Dinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
2,6-Dinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
2-Amino-4,6-dinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
4-Amino-2,6-dinitrotoluene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
hexahydro-1,3,5-trinitroso-1,3,5-triazi					
	5A-MW4-0718	0.2 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.2 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.24 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.22 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.22 ug/L	UJ	TEMP>6C	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8330B (WATER)					
hexahydro-1,3-dinitroso-5-nitro-1,3,5-					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
hexahydro-1-nitroso-3,5-dinitro-1,3,5-					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
HMX					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.2 ug/L	J	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
m-Nitrotoluene					
	5A-MW4-0718	0.2 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.2 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.24 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.22 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.22 ug/L	UJ	TEMP>6C	
Nitrobenzene					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.075 ug/L	J	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
o-Nitrotoluene					
	5A-MW4-0718	0.2 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.2 ug/L	UJ	TEMP>6C	

TABLE 9

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): SW8330B (WATER)					
	L3-DP1-2530-0718	0.24 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.22 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.22 ug/L	UJ	TEMP>6C	
p-Nitrotoluene					
	5A-MW4-0718	0.2 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.2 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.24 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.22 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.22 ug/L	UJ	TEMP>6C	
RDX					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.058 ug/L	J	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	
Tetryl					
	5A-MW4-0718	0.1 ug/L	UJ	TEMP>6C	
	5A-MW6-0718	0.1 ug/L	UJ	TEMP>6C	
	L3-DP1-2530-0718	0.12 ug/L	UJ	TEMP>6C	
	L3-DP2-1520-0718	0.11 ug/L	UJ	TEMP>6C	
	L3-DP3-3438-0718	0.11 ug/L	UJ	TEMP>6C	

TABLE 9

Blank Contamination - Qualified Data

pg/L = Undefined Unit in tlkpUnits

ug/L = micrograms per liter

Blank target = concentration of field or laboratory blank.

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

U = The analyte was not detected in the analysis. The associated numerical value is at or below the method detection limit (MDL).

UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

EB<RL	=	Equipment blank concentration less than the RL
EB>RL	=	Equipment blank concentration greater than the RL
LB<1/2RL	=	Laboratory blank contamination less than 1/2 the RL
LB<RL	=	Laboratory blank contamination less than the RL
SI	=	Sample Integrity, VOC vials with >6mm bubbles
TB<RL	=	Trip blank concentration less than RL
TEMP>6C	=	Temperature Blank>6C

TABLE 10

Field Duplicate Precision - Qualified Data

Analyte	Sample Identification	Result	Field Duplicate Qualifier*	Criteria	Validation Comments
Method (Matrix): SW8330B (WATER)					
hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)	WBP-TTMW-11-0319	23 ug/L	J	FD>RPD	
	WBP-TTMW-F11-0319	36 ug/L	J	FD>RPD	

RPD = relative percent difference

ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was positively identified, the quantitation is an estimate.

Criteria:

FD>RPD = Field duplicate exceeds RPD criteria

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8260B (WATER)					
1,1-Dichloroethene	FJAW-80-0319 / FD	39 ug/L	J	RPD = 21.34 Limit =20	LCSRPD
1,1,2-Trichloro-1,2,2-trifluoroethane	FTP-MW7-0319 / N	0.8 ug/L	J	RPD = 23.9 Limit =20	LCSRPD
1,1-Dichloroethene	JAW-58-0319 / N	1.4 ug/L	J	RPD = 21.34 Limit =20	LCSRPD
	JAW-59-0319 / N	110 ug/L	J	RPD = 21.34 Limit =20	LCSRPD
1,1,2-Trichloro-1,2,2-trifluoroethane	JAW-80-0319 / N	0.64 ug/L	J	RPD = 23.9 Limit =20	LCSRPD
1,1-Dichloroethene	JAW-80-0319 / N	35 ug/L	J	RPD = 21.34 Limit =20	LCSRPD
Carbon disulfide	L3AP-MW1-0818 / N	1.6 ug/L	UJ	%R = 58 LCL=64 UCL=133	LCS<LCL
1,1,2-Trichloro-1,2,2-trifluoroethane	WBP-99-1-0319 / N	1 ug/L	J	RPD = 23.9 Limit =20	LCSRPD
Method (Matrix): SW8290 (WATER)					
1,2,3,4,7,8-HxCDD	L9TTMW02-0418 / N	1.6 pg/L	J	%R = 130 LCL=80 UCL=126	LCS>UCL
Method (Matrix): SW8330B (WATER)					
2-Amino-4,6-dinitrotoluene	CCLTTMW004-0418 / N	0.12 ug/L	UJ	%R = 56 LCL= 79 UCL= 120	LCS<LCL
4-Amino-2,6-dinitrotoluene	CCLTTMW004-0418 / N	0.12 ug/L	UJ	%R = 71 LCL= 76 UCL= 125	LCS<LCL
	CCLTTMW004-0418 / N	0.12 ug/L	UJ	%R = 74 LCL= 76 UCL= 125	LCSD<LCL
4-Nitrotoluene	CONTG-FD1 / FD	0.41 ug/L	UJ	%R = 41 LCL= 77 UCL= 127	LCS<LCL
Nitrobenzene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 39 LCL= 65 UCL= 134	LCS<LCL
2-Amino-4,6-dinitrotoluene	CONTG-FD1 / FD	0.18 ug/L	J	%R = 56 LCL= 79 UCL= 120	LCS<LCL
2-Nitrotoluene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 66 LCL= 70 UCL= 127	LCS<LCL
4-Amino-2,6-dinitrotoluene	CONTG-FD1 / FD	0.25 ug/L	J	%R = 65 LCL= 76 UCL= 125	LCS<LCL
3-Nitrotoluene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 37 LCL= 79 UCL= 120	LCS<LCL
1,3-Dinitrobenzene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 74 LCL= 78 UCL= 120	LCSD<LCL
4-Amino-2,6-dinitrotoluene	CONTG-FD1 / FD	0.25 ug/L	J	%R = 58 LCL= 76 UCL= 125	LCSD<LCL
2,4-Dinitrotoluene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 69 LCL= 78 UCL= 120	LCSD<LCL
2,6-Dinitrotoluene	CONTG-FD1 / FD	0.21 ug/L	UJ	%R = 69 LCL= 77 UCL= 127	LCSD<LCL
2-Amino-4,6-dinitrotoluene	CONTG-FD1 / FD	0.18 ug/L	J	%R = 62 LCL= 79 UCL= 120	LCSD<LCL
2-Nitrotoluene	EBP-MW17-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	EBP-MW17-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	EBP-MW17-0319 / N	0.41 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
	EDA-SW01-0319 / N	0.44 ug/L	UJ	%R = 69 LCL=73 UCL=125	LCS<LCL
2-Nitrotoluene	EDA-SW01-0319 / N	0.22 ug/L	UJ	%R = 66 LCL=70 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	EDA-SW01-0319 / N	0.13 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Amino-4,6-dinitrotoluene	EDA-SW01-0319 / N	0.13 ug/L	UJ	%R = 70 LCL=79 UCL=120	LCS<LCL
3-Nitrotoluene	EDA-SW01-0319 / N	0.44 ug/L	UJ	RPD = 33.43 Limit =20	LCSRPD
2-Nitrotoluene	EDA-SW01-0319 / N	0.22 ug/L	UJ	RPD = 34.48 Limit =20	LCSRPD
Nitrobenzene	EDA-SW01-0319 / N	0.22 ug/L	UJ	RPD = 23.91 Limit =20	LCSRPD

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
4-Nitrotoluene	EDA-SW01-0319 / N	0.44 ug/L	UJ	RPD = 31.45 Limit =20	LCSRPD
2-Amino-4,6-dinitrotoluene	EDA-SW01-0319 / N	0.13 ug/L	UJ	RPD = 26.46 Limit =20	LCSRPD
4-Amino-2,6-dinitrotoluene	EDA-SW01-0319 / N	0.13 ug/L	UJ	RPD = 25.97 Limit =20	LCSRPD
2-Amino-4,6-dinitrotoluene	EDA-SW02-0319 / N	0.13 ug/L	UJ	%R = 70 LCL=79 UCL=120	LCS<LCL
2-Nitrotoluene	EDA-SW02-0319 / N	0.22 ug/L	UJ	%R = 66 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	EDA-SW02-0319 / N	0.43 ug/L	UJ	%R = 69 LCL=73 UCL=125	LCS<LCL
4-Amino-2,6-dinitrotoluene	EDA-SW02-0319 / N	0.13 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	EDA-SW02-0319 / N	0.43 ug/L	UJ	RPD = 31.45 Limit =20	LCSRPD
2-Amino-4,6-dinitrotoluene	EDA-SW02-0319 / N	0.13 ug/L	UJ	RPD = 26.46 Limit =20	LCSRPD
2-Nitrotoluene	EDA-SW02-0319 / N	0.22 ug/L	UJ	RPD = 34.48 Limit =20	LCSRPD
4-Amino-2,6-dinitrotoluene	EDA-SW02-0319 / N	0.13 ug/L	UJ	RPD = 25.97 Limit =20	LCSRPD
3-Nitrotoluene	EDA-SW02-0319 / N	0.43 ug/L	UJ	RPD = 33.43 Limit =20	LCSRPD
Nitrobenzene	EDA-SW02-0319 / N	0.22 ug/L	UJ	RPD = 23.91 Limit =20	LCSRPD
4-Nitrotoluene	G-14-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
Nitrobenzene	G-14-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Amino-2,6-dinitrotoluene	G-14-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Nitrotoluene	G-14-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	G-14-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Nitrotoluene	G15-0418 / N	0.42 ug/L	UJ	%R = 41 LCL= 77 UCL= 127	LCS<LCL
2-Nitrotoluene	G15-0418 / N	0.21 ug/L	UJ	%R = 66 LCL= 70 UCL= 127	LCS<LCL
4-Amino-2,6-dinitrotoluene	G15-0418 / N	0.23 ug/L	J	%R = 65 LCL= 76 UCL= 125	LCS<LCL
3-Nitrotoluene	G15-0418 / N	0.21 ug/L	UJ	%R = 37 LCL= 73 UCL= 125	LCS<LCL
2-Amino-4,6-dinitrotoluene	G15-0418 / N	0.18 ug/L	J	%R = 56 LCL= 79 UCL= 120	LCS<LCL
Nitrobenzene	G15-0418 / N	0.21 ug/L	UJ	%R = 39 LCL= 65 UCL= 134	LCS<LCL
2-Amino-4,6-dinitrotoluene	G15-0418 / N	0.18 ug/L	J	%R = 62 LCL= 79 UCL= 120	LCSD<LCL
2,6-Dinitrotoluene	G15-0418 / N	0.21 ug/L	UJ	%R = 69 LCL= 77 UCL= 127	LCSD<LCL
2,4-Dinitrotoluene	G15-0418 / N	0.21 ug/L	UJ	%R = 69 LCL= 78 UCL= 120	LCSD<LCL
4-Amino-2,6-dinitrotoluene	G15-0418 / N	0.23 ug/L	J	%R = 58 LCL= 76 UCL= 125	LCSD<LCL
1,3-Dinitrobenzene	G15-0418 / N	0.21 ug/L	UJ	%R = 74 LCL= 78 UCL= 120	LCSD<LCL
4-Amino-2,6-dinitrotoluene	G47-0418 / N RE	0.12 ug/L	UJ	%R = 71 LCL= 76 UCL= 125	LCS<LCL
2-Amino-4,6-dinitrotoluene	G47-0418 / N RE	0.12 ug/L	UJ	%R = 73 LCL= 79 UCL= 120	LCS<LCL
2,4-Dinitrotoluene	G47-0418 / N RE	0.21 ug/L	UJ	%R = 77 LCL= 78 UCL= 120	LCS<LCL
4-Amino-2,6-dinitrotoluene	GZ-2-1118 / N	0.1 ug/L	UJ	%R = 75 LCL=76 UCL=125	LCS<LCL
	GZ-2-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCSD<LCL
	GZ-2A-1118 / N	5.4 ug/L	J	%R = 75 LCL=76 UCL=125	LCS<LCL

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
4-Amino-2,6-dinitrotoluene	GZ-2A-1118 / N	5.4 ug/L	J	%R = 67 LCL=76 UCL=125	LCSD<LCL
3-Nitrotoluene	GZ-3-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
Nitrobenzene	GZ-3-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Amino-2,6-dinitrotoluene	GZ-3-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Nitrotoluene	GZ-3-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
4-Nitrotoluene	GZ-3-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	JAW-40-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	JAW-40-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
3-Nitrotoluene	JAW-40-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
2-Nitrotoluene	JAW-40-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
Nitrobenzene	JAW-40-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Amino-2,6-dinitrotoluene	JAW-41-1118 / N	0.1 ug/L	UJ	%R = 75 LCL=76 UCL=125	LCS<LCL
	JAW-41-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCSD<LCL
Nitrobenzene	JAW-47-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Nitrotoluene	JAW-47-1118 / N	0.21 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	JAW-47-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Nitrotoluene	JAW-47-1118 / N	0.21 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	JAW-47-1118 / N	0.21 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
2-Nitrotoluene	JAW-52-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	JAW-52-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Nitrotoluene	JAW-52-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
Nitrobenzene	JAW-52-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Amino-2,6-dinitrotoluene	JAW-52-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
Nitrobenzene	L1-MW102-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
2-Nitrotoluene	L1-MW102-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-MW102-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-MW102-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	L1-MW102-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
2-Nitrotoluene	L1-MW103-0319 / N	0.21 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	L1-MW103-0319 / N	0.21 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	L1-MW103-0319 / N	0.41 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	L1-MW104-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-MW104-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
Nitrobenzene	L1-MW104-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Nitrotoluene	L1-MW104-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
4-Amino-2,6-dinitrotoluene	L1-MW104-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
3-Nitrotoluene	L1-MW-105-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
2-Nitrotoluene	L1-MW-105-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-MW-105-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
Nitrobenzene	L1-MW-105-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
4-Nitrotoluene	L1-MW-105-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
2-Nitrotoluene	L1-MW106-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-MW106-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-MW106-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	L1-MW106-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
Nitrobenzene	L1-MW106-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
2-Nitrotoluene	L1-TTMW-100-1118 / N	0.23 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-TTMW-100-1118 / N	0.23 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-TTMW-100-1118 / N	0.11 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
4-Nitrotoluene	L1-TTMW-100-1118 / N	0.23 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
Nitrobenzene	L1-TTMW-100-1118 / N	0.11 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
	L1-TTMW-101-1118 / N	0.1 ug/L	UJ	%R = 60 LCL=65 UCL=134	LCS<LCL
2-Nitrotoluene	L1-TTMW-101-1118 / N	0.2 ug/L	UJ	%R = 28 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	L1-TTMW-101-1118 / N	0.2 ug/L	UJ	%R = 33 LCL=73 UCL=125	LCS<LCL
4-Nitrotoluene	L1-TTMW-101-1118 / N	0.2 ug/L	UJ	%R = 40 LCL=71 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	L1-TTMW-101-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCS<LCL
2-Nitrotoluene	L3AP-TW19-01-3545-041	0.21 ug/L	UJ	%R = 68 LCL=70 UCL=127	LCS<LCL
	L3AP-TW19-02-3545-041	0.21 ug/L	UJ	%R = 68 LCL=70 UCL=127	LCS<LCL
	L3AP-TW19-03-3545-041	0.21 ug/L	UJ	%R = 68 LCL=70 UCL=127	LCS<LCL
4-Amino-2,6-dinitrotoluene	LI-MW107-1118 / N	0.1 ug/L	UJ	%R = 75 LCL=76 UCL=125	LCS<LCL
	LI-MW107-1118 / N	0.1 ug/L	UJ	%R = 67 LCL=76 UCL=125	LCSD<LCL
2-Nitrotoluene	NBPLF-MW3-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	NBPLF-MW3-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	NBPLF-MW3-0319 / N	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-99-4-0319 / N	0.2 ug/L	UJ	%R = 67 LCL=70 UCL=127	LCS<LCL
	WBP-99-6-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-99-6-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-99-6-0319 / N	0.41 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-MW1-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	WBP-MW1-0319 / N	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL

TABLE 11

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8330B (WATER)					
2-Nitrotoluene	WBP-MW1-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
	WBP-MW3-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-MW3-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-MW3-0319 / N	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-MW8-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	WBP-MW8-0319 / N	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-MW8-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
	WBP-MW9-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-MW9-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-MW9-0319 / N	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-05B-0319 /	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
3-Nitrotoluene	WBP-TTMW-05B-0319 /	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-05B-0319 /	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
	WBP-TTMW-06-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-TTMW-06-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-TTMW-06-0319 / N	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-10-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-TTMW-10-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-TTMW-10-0319 / N	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-11-0319 / N	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-TTMW-11-0319 / N	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-TTMW-11-0319 / N	0.4 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL
2-Nitrotoluene	WBP-TTMW-F11-0319 /	0.2 ug/L	UJ	%R = 69 LCL=70 UCL=127	LCS<LCL
	WBP-TTMW-F11-0319 /	0.2 ug/L	UJ	%R = 64 LCL=70 UCL=127	LCSD<LCL
3-Nitrotoluene	WBP-TTMW-F11-0319 /	0.39 ug/L	UJ	%R = 71 LCL=73 UCL=125	LCSD<LCL

TABLE 11

Laboratory Control Sample - Qualified Data

%R = percent recovery

pg/L = Undefined Unit in tlkpUnits

ug/L = micrograms per liter

QAQC Type

N = Normal Environmental Sample
FD = Field Duplicate

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J	=	The analyte was positively identified, the quantitation is an estimate.
UJ	=	The analyte was not detected, the quantitation is an estimate.

Criteria:

LCS<LCL	=	LCS recovery less than lower control limit
LCS>UCL	=	LCS recovery greater than upper control limit
LCSD<LCL	=	LCSD recovery less than the lower control limit
LCSRPD	=	LCSD RPD criteria exceeded

TABLE 12

Calibration Criteria - Qualified Data

Analyte	Sample Identification	Result	Calibration Qualifier*	Criteria	Validation Comments
Method (Matrix): SW8260B (WATER)					
1,2-Dibromo-3-chloropropane	EDA-SW01-0319	1.6 ug/L	UJ	CCV<LCL	
	EDA-SW02-0319	1.6 ug/L	UJ	CCV<LCL	
	FJAW-80-0319	1.6 ug/L	UJ	CCV<LCL	
	FTP-MW7-0319	1.6 ug/L	UJ	CCV<LCL	
	FTP-MW8-0319	1.6 ug/L	UJ	CCV<LCL	
	JAW-58-0319	1.6 ug/L	UJ	CCV<LCL	
	JAW-59-0319	1.6 ug/L	UJ	CCV<LCL	
	JAW-80-0319	1.6 ug/L	UJ	CCV<LCL	
	WBP-99-1-0319	1.6 ug/L	UJ	CCV<LCL	
Bromoform	EDA-SW01-0319	1 ug/L	UJ	CCV<LCL	
	EDA-SW02-0319	1 ug/L	UJ	CCV<LCL	
	FJAW-80-0319	1 ug/L	UJ	CCV<LCL	
	FTP-MW7-0319	1 ug/L	UJ	CCV<LCL	
	FTP-MW8-0319	1 ug/L	UJ	CCV<LCL	
	JAW-58-0319	1 ug/L	UJ	CCV<LCL	
	JAW-59-0319	1 ug/L	UJ	CCV<LCL	
	JAW-80-0319	1 ug/L	UJ	CCV<LCL	
	WBP-99-1-0319	1 ug/L	UJ	CCV<LCL	
Bromomethane	EDA-SW01-0319	0.8 ug/L	UJ	CCV<LCL	
	EDA-SW02-0319	0.8 ug/L	UJ	CCV<LCL	
	FJAW-80-0319	0.8 ug/L	UJ	CCV<LCL	
	FTA-TT-MW-02-0319	32 ug/L	UJ	CCV<LCL	
	FTP-MW7-0319	0.8 ug/L	UJ	CCV<LCL	
	FTP-MW8-0319	0.8 ug/L	UJ	CCV<LCL	
	JAW-58-0319	0.8 ug/L	UJ	CCV<LCL	
	JAW-59-0319	0.8 ug/L	UJ	CCV<LCL	
	JAW-80-0319	0.8 ug/L	UJ	CCV<LCL	
	L3AP-TW19-01-3545-0419	0.8 ug/L	UJ	CCV<LCL	
	L3AP-TW19-02-3545-0419	0.8 ug/L	UJ	CCV<LCL	
	L3AP-TW19-03-3545-0419	0.8 ug/L	UJ	CCV<LCL	
	WBP-99-1-0319	0.8 ug/L	UJ	CCV<LCL	
	WBP-MW1-0319	0.8 ug/L	UJ	CCV<LCL	
	WBP-TTMW-05B-0319	0.8 ug/L	UJ	CCV<LCL	

%D = percent difference

ug/L = micrograms per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

UJ = The analyte was not detected, the quantitation is an estimate.

Criteria:

CCV<LCL = Continuing calibration recovery less than lower control limit

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
E218.6	Hexavalent Chromium	UG/L	17	9	8		2			100	100
SW6020	Aluminum	MG/L	2	2						100	100
	Aluminum, dissolved	MG/L	2	1	1					100	100
	Antimony	MG/L	2		2					100	100
	Antimony, dissolved	MG/L	2		2					100	100
	Arsenic	MG/L	37	7	30		3			100	100
	Arsenic, dissolved	MG/L	2		2					100	100
	Barium	MG/L	32	32			5			100	100
	Barium, dissolved	MG/L	2	2						100	100
	Beryllium	MG/L	2		2					100	100
	Beryllium, dissolved	MG/L	2		2					100	100
	Cadmium	MG/L	32	3	29		1			100	100
	Cadmium, dissolved	MG/L	2		2					100	100
	Calcium	MG/L	2	2			1			100	100
	Calcium, dissolved	MG/L	2	2			1			100	100
	Chromium	MG/L	32	1	31		1			100	100
	Chromium, dissolved	MG/L	2		2					100	100
	Cobalt	MG/L	2		2					100	100
	Cobalt, dissolved	MG/L	2		2					100	100
	Copper	MG/L	2	1	1		1			100	100
	Copper, dissolved	MG/L	2	1	1		1			100	100
	Iron	MG/L	2	2						100	100
	Iron, dissolved	MG/L	2	2			1			100	100
	Lead	MG/L	32	3	29		2			100	100
	Lead, dissolved	MG/L	2		2					100	100
	Magnesium	MG/L	2	2			1			100	100
	Magnesium, dissolved	MG/L	2	2			1			100	100
	Manganese	MG/L	2	2			1			100	100
	Manganese, dissolved	MG/L	2	2						100	100
	Molybdenum, dissolved	MG/L	2		2					100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences								
			Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
SW6020	Molydbenum	MG/L	2	1	1		1			100	100
	Nickel	MG/L	2	1	1		1			100	100
	Nickel, dissolved	MG/L	2		2					100	100
	Potassium	MG/L	2	2			1			100	100
	Potassium, dissolved	MG/L	2	2			1			100	100
	Selenium	MG/L	32	3	29		3			100	100
	Selenium, dissolved	MG/L	2		2					100	100
	Silver	MG/L	32		32					100	100
	Silver, dissolved	MG/L	2		2					100	100
	Sodium	MG/L	2	2			1			100	100
	Sodium, dissolved	MG/L	2	2			1			100	100
	Thallium	MG/L	2		2					100	100
	Thallium, dissolved	MG/L	2		2					100	100
	Vanadium	MG/L	2	1	1		1			100	100
	Vanadium, dissolved	MG/L	2		2					100	100
	Zinc	MG/L	2		2					100	100
	Zinc, dissolved	MG/L	2	1	1		1			100	100
SW7470A	Mercury, Dissolved	UG/L	2		2					100	100
	Mercury, Total	UG/L	32		32					100	100
SW8082	Aroclor-1016	MG/KG	4		4		1			100	100
	Aroclor-1221	MG/KG	4		4		1			100	100
	Aroclor-1232	MG/KG	4		4		1			100	100
	Aroclor-1242	MG/KG	4		4		1			100	100
	Aroclor-1248	MG/KG	4		4		1			100	100
	Aroclor-1254	MG/KG	4		4		1			100	100
	Aroclor-1260	MG/KG	4		4		1			100	100
SW8151A	Pentachlorophenol	UG/L	3		3		3			100	100
SW8260B	1,1,1,2-Tetrachloroethane	UG/L	64		64		21			100	100
	1,1,1-TCA	UG/L	64	16	48		26			100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
			Number of Occurrences								
SW8260B	1,1,2,2-Tetrachloroethane	UG/L	64		64		21			100	100
	1,1,2-TCA	UG/L	64	4	60		22			100	100
	1,1,2-Trichloro-1,2,2-trifluoroethane	UG/L	44	13	31		18			100	100
	1,1-DCA	UG/L	64	23	41		27			100	100
	1,1-DCE	UG/L	63	19	44		25			100	100
	1,1-Dichloropropene	UG/L	64		64		21			100	100
	1,2,3-Trichlorobenzene	UG/L	64		64		21			100	100
	1,2,3-Trichloropropane	UG/L	64		64		21			100	100
	1,2,4-Trichlorobenzene	UG/L	64		64		21			100	100
	1,2,4-Trimethylbenzene	UG/L	64	12	52		26			100	100
	1,2-DCA	UG/L	64	11	53		28			100	100
	1,2-DCB	UG/L	64	1	63		22			100	100
	1,2-Dibromo-3-chloropropane	UG/L	64		64		27			100	100
	1,2-Dibromoethane (EDB)	UG/L	64		64		21			100	100
	1,2-Dichloropropane	UG/L	64	1	63		22			100	100
	1,3,5-Trimethylbenzene	UG/L	64	8	56		24			100	100
	1,3-DCB	UG/L	64		64		21			100	100
	1,3-Dichloropropane	UG/L	64		64		21			100	100
	1,4-DCB	UG/L	64		64		21			100	100
	1-Chlorohexane	UG/L	64	2	62		22			100	100
	2,2-Dichloropropane	UG/L	64		64		21			100	100
	2-Chlorotoluene	UG/L	64		64		21			100	100
	2-Hexanone	UG/L	64	1	63		22			100	100
	4-Chlorotoluene	UG/L	64		64		21			100	100
	Acetone	UG/L	64	14	50		25			100	100
	Benzene	UG/L	64	13	51		23			100	100
	Bromobenzene	UG/L	64		64		21			100	100
	Bromochloromethane	UG/L	64		64		21			100	100
	Bromodichloromethane	UG/L	64	2	62		23			100	100
	Bromoform	UG/L	64		64		27			100	100
	Bromomethane	UG/L	64	5	59		34			100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
			Number of Occurrences								
SW8260B	Carbon disulfide	UG/L	64	3	61		23			100	100
	Carbon tetrachloride	UG/L	64		64		21			100	100
	Chlorobenzene	UG/L	64		64		21			100	100
	Chloroethane	UG/L	63	5	58		21			100	100
	Chloroform	UG/L	64	16	48		29			100	100
	Chloromethane	UG/L	64	3	61		21			100	100
	Cis-1,2-DCE	UG/L	64	20	44		27			100	100
	cis-1,3-Dichloropropene	UG/L	64		64		21			100	100
	Dibromochloromethane	UG/L	64	1	63		22			100	100
	Dibromomethane	UG/L	64		64		21			100	100
	Dichlorodifluoromethane	UG/L	64	9	55		23			100	100
	Ethylbenzene	UG/L	64	11	53		22			100	100
	Hexachlorobutadiene	UG/L	64		64		21			100	100
	Isopropylbenzene	UG/L	64	4	60		22			100	100
	m,p-Xylene	UG/L	64	10	54		23			100	100
	MEK (2-Butanone)	UG/L	64	6	58		23			100	100
	Methyl tert-butyl ether (MTBE)	UG/L	64		64		21			100	100
	Methylene chloride	UG/L	64	5	59		23			100	100
	MIBK (Methyl isobutyl ketone)	UG/L	64	4	60		22			100	100
	Naphthalene	UG/L	64	6	58		22			100	100
	n-Butylbenzene	UG/L	64	4	60		22			100	100
	n-Propylbenzene	UG/L	64	6	58		22			100	100
	o-Xylene	UG/L	64	8	56		22			100	100
	p-Isopropyltoluene	UG/L	64	8	56		24			100	100
	sec-Butylbenzene	UG/L	64	5	59		21			100	100
	Styrene	UG/L	64		64		21			100	100
	TCE	UG/L	64	19	45		29			100	100
	tert-Butylbenzene	UG/L	64		64		21			100	100
	Tetrachloroethene	UG/L	64	10	54		24			100	100
	Toluene	UG/L	64	14	50		26			100	100
	trans-1,2-DCE	UG/L	64	4	60		22			100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences: Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
SW8260B	trans-1,3-Dichloropropene	UG/L	64		64		21			100	100
	Trichlorofluoromethane	UG/L	64		64		21			100	100
	Vinyl chloride	UG/L	64	5	59		22			100	100
SW8270-SIM	Pentachlorophenol	UG/L	3	3						100	100
SW8290	1,2,3,4,6,7,8,9-Octachlorodibenzofuran	PG/L	4	1	3		1			100	100
	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	1,2,3,4,6,7,8-Heptachlorodibenzofuran	PG/L	4	1	3		1			100	100
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	1,2,3,4,7,8,9-Heptachlorodibenzofuran	PG/L	4		4					100	100
	1,2,3,4,7,8-Hexachlorodibenzofuran	PG/L	4		4					100	100
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	1,2,3,6,7,8-Hexachlorodibenzofuran	PG/L	4	1	3		1			100	100
	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	PG/L	4	1	3		1			100	100
	1,2,3,7,8,9-Hexachlorodibenzofuran	PG/L	4		4					100	100
	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	PG/L	4	1	3		1			100	100
	1,2,3,7,8-Pentachlorodibenzofuran	PG/L	4		4					100	100
	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	2,3,4,6,7,8-Hexachlorodibenzofuran	PG/L	4	1	3		1			100	100
	2,3,4,7,8-Pentachlorodibenzofuran	PG/L	4		4					100	100
	2,3,7,8-Tetrachlorodibenzofuran	PG/L	1		1					100	100
	2,3,7,8-Tetrachlorodibenzo-p-dioxin	PG/L	4		4					100	100
	Total HpCDD	PG/L	4		4					100	100
	Total HpCDF	PG/L	4	1	3		1			100	100
	Total HxCDD	PG/L	4		4					100	100
	Total HxCDF	PG/L	4		4					100	100
	Total PeCDD	PG/L	4		4					100	100
	Total PeCDF	PG/L	4		4					100	100
	Total TCDD	PG/L	4		4					100	100
	Total TCDF	PG/L	4		4					100	100

TABLE 13

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor Completeness (%)	Overall Completeness (%)
			Number of Occurrences								
SW8330B	1,3,5-Trinitrobenzene	UG/L	212	15	197		46			100	100
	1,3-Dinitrobenzene	UG/L	210	5	205		45			100	100
	2,4,6-Trinitrotoluene	UG/L	211	5	206		43			100	100
	2,4-Dinitrotoluene	UG/L	210	3	207		40			100	100
	2,6-Dinitrotoluene	UG/L	210	8	202		44			100	100
	2-Amino-4,6-dinitrotoluene	UG/L	210	17	193		53			100	100
	4-Amino-2,6-dinitrotoluene	UG/L	209	28	181		54			100	100
	hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX)	UG/L	205	25	180		49			100	100
	hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX)	UG/L	207	33	174		61			100	100
	hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX)	UG/L	208	51	157		58			100	100
	HMX	UG/L	191	65	126		62			100	100
	m-Nitrotoluene	UG/L	210	3	207		58			100	100
	Nitrobenzene	UG/L	210	7	203		46			100	100
	o-Nitrotoluene	UG/L	210	2	208		60			100	100
	p-Nitrotoluene	UG/L	210	3	207		45			100	100
	RDX	UG/L	182	54	128		46			100	100
	Tetryl	UG/L	212	6	206		46			100	100

% = Percent
J-Flags = Estimated results
R-Flags = Rejected results
mg/Kg = milligrams per kilogram
mg/L = milligrams per liter
pg/L = Undefined Unit in tlkpUnits
UG/L = micrograms per liter

Appendix C
Field Documentation

ch2m:	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	**Boring ID** **EBP-MW7**	Sheet 1 of 4

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP

Weather: Sunny 75 degrees F **Drilling Contractor:** Cascade

Drilling Method and Equipment Used: Mini Sonic 6" Rods

Water Level: **Start Date & Time:** 8/16/18 at 13:20 **End Date & Time:** 8/16/18 at 13:50 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	5.0	S1	CL	0 - 5' - **CL**: lean clay, trace sand and gravel, dark yellowish brown, (10YR 4/6), mottled orange and black, dry to moist, very stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
5	5-10	5.0	S2	CL	5 - 7' - **CL**: lean clay, trace sand and gravel, dark yellowish brown, (10YR 4/6), mottled orange and black, dry to moist, very stiff	- 0.0 ppm - 0.0 ppm
					7 - 18' - **CL**: lean clay, trace sand and gravel, dark yellowish brown, (10YR 4/6), trace gray, (10YR 6/1) increasing with depth, mottled orange and black, dry to moist, very stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm
10	10-15	5.0	S3			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
15	15-18	3.0	S4			- 0.0 ppm Driller: used auger bit instead of rock bit - 0.0 ppm - 0.0 ppm - 0.0 ppm
					18' - Bedrock - weathered - at 18' bgs; log continued on next page	
20						
25						
30						

ch2m:

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW7**	Sheet 2 of 4

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork
Site Location: WBP
Weather:
Drilling Contractor: Cascade
Drilling Method and Equipment Used: Mini Sonic Headquarters Wireless
Orientation: Vertical
Water Level:
Start Date & Time: 8/16/18 at 15:00
End Date & Time: 8/18/18 at 11:59
Logged By: L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
5						
10						
15						
18–20	R1 67%	42%	1 10+ NR	18.6', 19.6' Fracture orientation 0 degrees, Rough and Undulating, washed out 19.8' - 20.0' Fracture zone, cobbled up chunks, washed out 21.5' - 21.9' highly weathered zone, claylike	18' - 20' **LIMESTONE**, very light gray (N8) and medium gray (N5), medium grained, sound to extremely fractured, very thin to thin beds, moderately weathered, rock is washed out where it is very weak and disintegrated. Strong.	R1: 15:00 - 15:15 60 gallons Stop because 60% return Rig is not reving up properly Kevin checks rig.
	R2 83%	46%	10+	22.2', 22.4', 22.7', Fracture orientation 0 degrees, Rough and Planar, clay discolored in fractures	21' - 22' as above, moderate to highly weathered soil like in bottom half	R2: 15:18 - 15:24 75 gallons, 50% return
25	R3 3%	48%	3 10+ 3 3 2	23' - 23.3' highly weathered zone 23.7' Fracture orientation 0 degrees, Rough and Planar, clay, discolored in fracture 23.9' Fracture orientation 5 degrees, Rough and Undulating 24.1' Fracture orientation 5 degrees, Rough/Undulating 24.5', 24.9' Fracture orientation, Rough/Undulating 25.0' Fracture orientation, Rough/Undulating, tighly healed 25.5' Fracture orientation, Strong/Undulating 25.8' Fracture orientation 0 degrees, Rough/Undulating 26.0' Fracture orientation 5 degrees, Strong/Undulating	22' - 27' Interbedded **LIMESTONE** and **SHALE**, **LIMESTONE** very light gray (N8) and medium gray (N5), medium grained, sound to extremely fractured, very thin to thin beds, moderately weathered, rock is washed out where it is very weak and disintegrated. Strong. **SHALE**, dark gray (N3), laminated to very thin, sound to extremely fractured, soil like at 23' - 23.3', moderately weathered to slightly weathered, RO extremely weak.	Co meter keeps going off, may be associated with rig. R3: 15:47 - 16:05 125 gallons 60% return CO is coming from generator Drillers man generator
30	R4 100%	8%	4 1 4	26.3' Fracture orientation 0 degrees, Strong/Undulating 27.2', 27.3', 27.6', 27.7' Fracture orientation 0 degrees, Strong/Undulating, clay in fractures, washed out partially 28.2', 29.5', 29.6', 29.7', 29.8' Fracture orientation 0 degrees, Strong and Planar	27 - 30' Interbedded **LIMESTONE** and **SHALE**, **LIMESTONE** very light gray (N8) and medium gray (N5), medium grained, sound to extremely fractured, very thin to thin beds, moderately weathered, rock is washed out where it is very weak and disintegrated. Strong. SHALE, dark gray (N3), laminated to very thin, sound to extremely fractured, soil like at 23' - 23.3', moderately weathered to slightly weathered, RO extremely weak.	R4: 16;25 - 16:45 120 gallons 60% return

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW7**	Sheet 3 of 4

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork
Site Location: EBP
Weather:
Drilling Contractor: Cascade
Drilling Method and Equipment Used: Mini Sonic Headquarters Wireless
Orientation: Vertical
Water Level:
Start Date & Time: 8/16/18 at 15:00
End Date & Time: 8/18/18 at 11:59
Logged By: L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R4 100%	8%	10+ 10+	30.6' - 30.7' Fracture zone, orientation 0 - 90%, Rough/Undulating, blockly breaks 31.0' - 31.1' as above, 31.9' - 32' clay, weathered zone	30' - 32' Same as 27' - 30'	
35	R5 98%	55%	3 5 4 1 1	32.2'. 32.3' Fracture orientation 0 degrees, Strong and Planar 33.2', 33.5', 33.6', 33.7', 33.8' Fracture orientation 0 degrees, Rough and Undulating, washed out 34.3', 34.6', 34.7', 34.8' Fracture orientation 0 degrees, Rough and Undulating 35.7' Fracture orientation 0 degrees, Rough and Undulating bedding plane, washed out 36.6' Fracture orientation 0 degrees, Rough and Undulating, broken up a little, washed out	32' - 37' Interbedded **LIMESTONE** and **SHALE**, **LIMESTONE** very light gray (N8) and medium gray (N5), medium grained, sound to extremely fractured, very thin to thin beds, moderately weathered, rock is washed out where it is very weak and disintegrated. Strong. **SHALE,** dark gray (N3), laminated to very thin, sound to extremely fractured, soil like at 23' - 23.3', moderately weathered to slightly weathered, RO extremely weak.	R5: 16:50 - 17:02 100 gallons 60% return
40	R6 95%	87%	0 1 0 1	38.9' Fracture orientation 0 degrees, Rough and Undulating, washed out 40.1' , 40.8', 41.2' Fracture orientation 0 degrees, Rough and Undulating, washed out	37' - 40.5' Interbedded **LIMESTONE** and **SHALE**, **LIMESTONE** very light gray (N8) and medium gray (N5), medium grained, sound to extremely fractured, very thin to thin beds, moderately weathered, rock is washed out where it is very weak and disintegrated. Strong. **SHALE**, dark gray (N3), laminated to very thin, sound to extremely fractured, soil like at 23' - 23.3', moderately weathered to slightly weathered, RO extremely weak, fresh	R6: 0745 - 08:05 Driller: No recovery at 41.5' - 42' May have picked up additional
	R7 100%	46%	2	41.2', Fracture orientation 0 degrees, Rough and Undulating, washed out. Hard drilling 41.5' - 42' bgs	40.5' - 41.5' same as above 41.5' - 44' same as above	R7: 08:09 - 08:15
	R8 100%	63%	1 3	42.8', Fracture orientation 0 degrees, Strong and Planar, washed out		R8: 08:58 - 09:00 Stop driller, having problems with portion of core run to 42" bgs
45	R9 92%	83%	1 1 0	44.2' Fracture orientation 0 degrees, Rough and Undulating, washed out 45.2' Fracture orientation 0 degrees, Rough and Undulating, washed out	44' - 47' - same as above	Working out H&S for upcoming work while driller works out bit issues
50	R10 98%	85%	0 0 0 0 0	All MBs washed out in a few places. Breaks easily along bedding planes.	47' - 52' Interbedded **LIMESTONE** and **SHALE**, **LIMESTONE** very light gray (N8) and medium gray (N5), medium grained, sound to extremely fractured, very thin to thin beds, moderately weathered, rock is washed out where it is very weak and disintegrated. Strong. SHALE, dark gray (N3), laminated to very thin, sound to extremely fractured, soil like at 23' - 23.3', moderately weathered to slightly weathered, RO extremely weak, fresh	300 gallons 50% return between 41.5' and 51.5' bgs
55	R11 3%	83%	0 0 0 0 0	All MBs washed out in a few places. Breaks easily along bedding planes.	52' - 57' Interbedded **LIMESTONE** and **SHALE, LIMESTONE** very light gray (N8) and medium gray (N5), medium grained, sound to extremely fractured, very thin to thin beds, moderately weathered, rock is washed out where it is very weak and disintegrated. Strong. SHALE, dark gray (N3), laminated to very thin, sound to extremely fractured, soil like at 23' - 23.3', moderately weathered to slightly weathered, RO extremely weak, fresh	R11: 11:25 - 11:34
60	R12 100%	96%	0 0 0	All MBs washed out in a few places. Breaks easily along bedding planes.	57' - 60' same as above	R12: 11:45 - 11:59

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID EBP-MW7	Sheet 4 of 4

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP
Weather: **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic Headquarters Wireless **Orientation:** Vertical
Water Level: **Start Date & Time:** 8/16/18 at 15:00 **End Date & Time:** 8/18/18 at 11:59 **Logged By:** L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R12 100%	96%	0 0	All MBs washed out in a few places. Breaks easily along bedding planes.	60' - 62' Same as 57' - 60"	Initial SL = 59.9' below take after cleaning out and purging dry then pulling pump.
				End of boring at 62' bgs		8/18/18 WL = 59'
65						
70						
75						
80						
85						
90						

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID EBP-MW8

Sheet 1 of 1

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP

Weather: NA **Drilling Contractor:** Dakota

Drilling Method and Equipment Used: Geoprobe 6620 DT

Water Level: **Start Date & Time:** 7/10/18 at 11:05 **End Date & Time:** 7/10/2018 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	5.0	DP1	CL	0 - 3.5' - **CL**: lean clay, trace gravel and sand, yellowish brown, (10YR 5/4), and light brownish gray, (10YR 6/2), mottled black and orange, moist, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm
					3.5 - 4' - **CL**: lean clay, yellowish brown, (10YR 5/4), and light brownish gray, (10YR 6/2), mottled black and orange, moist, stiff, silty fine sand	- 0.0 ppm
5					4 - 24.5' - **CL**: lean clay, trace gravel and sand, yellowish brown, (10YR 5/4), and light brownish gray, (10YR 6/2), mottled black and orange, moist, stiff	- 0.0 ppm
10	5-10	5.0	DP2			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
15	10-15	5.0	DP3			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
20	15-20	5.0	DP4			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
25	20-25	4.5	DP5			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
					End of boring at 24.5' bgs - hard clay like/rock at the bottom	
30						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW9**	Sheet 1 of 3

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** WBP
Weather: **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: **Orientation:** Vertical
Water Level: **Start Date & Time:** 8/4/18 at 10:01 **End Date & Time:** 8/4/18 at 17:30 **Logged By:** M. Tekle/CLT

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
				0' - 23.5' bgs See boring log for EBP-MW8 for overburden		
5						
10						
15						
20						
23.5				23.5' top of bedrock		
25	R1	66%	10+	24' - 26' Fracture zone, moderately to highly weathered, lean clay probably washed out, yellowish orange staining	24' - 26' **LIMESTONE** with lean clay, light gray (N7) and light olive gray (5Y 6/1), **LIMESTONE** with lean clay, very weak, moderately to highly weathered, strong to very weak	R1: 11:15 - 11:30 70 gallons 100% return
	R2 44%	7%	10+ 4 NR NR	26' - 27.1' Fracture zone, moderately weathered, yellowish red staining 27.2', Fracture orientation 0 degrees, Rough and Planar 28' - 29' No Recovery 29.5' - 30' No Recovery	26' - 30' **LIMESTONE**, yellowish gray (5Y 7/2), fine to medium grained, slightly to moderately weathered, medium to strong	R2: 11:30 - 11:53 140 gallons 60% return Rod drop at 28' - 29' and 29.5' - 30' No water return at 30'
30						

ch2m:	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW9**	Sheet 2 of 3

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP
Weather: **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: **Orientation:** Vertical
Water Level: **Start Date & Time:** 8/4/18 at 10:01 **End Date & Time:** 8/4/18 at 17:30 **Logged By:** M. Tekle/CLT

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R3 100%	83%	2	30.1' Fracture along Shale bed, orientation 0 degrees, Rough/Planar, moderate to highly weathered 30.6' Fracture orientation 45 degrees, Rough/Undulating, few stainng yellowish red 30.9' - 31' Fracture zone, yellowish orange staining	31' - 31' **LIMESTONE**, very light gray (N8), very fine to medium trained, slightly weathered, medium strong	R3: 13:10 - 13:13 30 gallons, no return
35	R4 74%	55%	0 0 0 0	31.0' - 31.2' Fracture orientation 0 degrees, Rough/Planar 31.6' Fracture orientation 45 degrees, Rough/Undulating 32' - 33.5' clay with weathered limestone 33.7' Fracture orientation 0 degrees, Rough/Undualting, yellowish red staining 34.2' Fracture orientation 0 degrees, Rough and Undulating 35.1' Fracture orientation 10 degrees, highly weathered, partly healed	31' - 35.5' **LIMESTONE**, light gray (N7) to moderate yellow (5Y 7/6), very fine grained, moderately to highly weathered, medium strong to very weak, clay layer at 32' - 22.5', probably washed out	R4: 13:14 - 13:25 90 gallons No return
	R5 100%	72%	10+ 2	35.5' - 36' Fracture zone, highly weathered and significant yellowish red staining 36.2', 36.5' Fracture orientation 0 degrees, Rough/Planar 37.4' Fracture orientation 45 degrees, Rough/Undulating 37.6' Fracture orientation 10 degrees, Rough/Undulating 37.8' Fracture orientation 0 degrees, Rough/Planar	35.5 - 38' **LIMESTONE** with few **SHALE** layers at 36' - 36.5', greenish gray (5Y 6/1) to very light gray (N8), very fine to medium grained, slightly to moderately weathered, medium strong	R5: 13:41 - 13:50 90 gallons No return
40	R6 92%	43%	2 10+ 2	38.6' Fracture orientation 0 degrees, Rough/Planar 38.9 - 39.8' highly weathered limestone, Shale and lean clay 40.6' , 40.8' Fracture orientation 0 degrees, Rough and Planar, 40.8' Fracture along Shale bedding	38' - 41' **LIMESTONE** with **SHALE** and clay layer, light gray (N7) to medium dark gray (N4), fine to medium grained, slightly to highly weathered, very weak to strong, 40.8' - 41" more **SHALE**	R6: 13:52 to 14:01 80 gallons No return
45	R7 100%	85%	3 0 1 1 0	41.2', 41.4', 41.5' Fracture orientation 0 degrees, fracture along Shale bedding, Rough and Planar 43.9' Fracture orientation 0 degrees, Rough and Undulating 44.5' Fracture orientation 0 degrees, Rough and Planar	41' - 46' **SHALE** with **LIMESTONE** layers at 41.5' -0 42.1' and 44.9' - 46' light gray (N7) to medium gray, (N5), and medium dark gray (N4), very fine grained to medium grained, laminations, slightly weathered, medium to strong	R7: 14:10 - 14:18 90 gallons No return
	R8 67%	0%	10+	46' - 47' Fracture zone	SAA, few **LIMESTONE**	R8: 14:23 - 14:38 40 gallons/No recovery
50	R9 100%	80.6%	2 1 2 2	47.2' Fracture orientation 0 degrees, Rough/Planar 47.7' Fracture orientation 0 degrees,Rough/Undulating 48.8', 49.1' Fracture orientation 0 degrees, Rough and Planar 49.6' Fracture orientation 35 degrees, Rough and Undulating 50.3', 50.6' Fracture orientation 0 degrees, Rough and Undulating	47' - 51.5' **SHALE** with **LIMESTONE** interbedding, medium light gray (N6) to medium dark gray (N4), fine to medium grained, slightly weathered, medium strong	R9: 14:45 - 15:00 105 gallons No return
55	R10 100%	99%	2 1 0 0	51.9' Fracture orientation 0 degrees, Rough and Planar 52.1' Fracture orientation 0 degrees, Rough and Planar 53.5' Fracture along SHALE bedding, 0 degrees, Rough and Planar	51.5' - 53.5' SAA 53.5' - 56' **LIMESTONE**, light gray (N7), fine to medium grained, slightly weathered, strong, 55.9' color change to medium dark gray (N4)	R10: 15:10 - 15:18 100 gallons No return
60	R11 44%	32%	0 2 2	57.6' - 57.8' Fracture along the Shale bedding, orientation 0 degrees, Rough and Planar 58.2' - 60' No recovery	56' - 57.6' **LIMESTONE** with **SHALE** layer, light gray (N7), fine to medium grained, slightly weathered, strong 57.6' - 58.2' **SHALE**, medium dark gray (N4), very fine grained, moderately weathered, weak to medium strong 58.2' - 60' No recovery	R11: 15:26 - 15:40 At 59' bgs, started getting a little return water 100 gallons No return

ch2m:	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	**Boring ID** EBP-MW9	Sheet 3 of 3

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork
Site Location: EBP
Weather:
Drilling Contractor: Cascade
Drilling Method and Equipment Used:
Orientation: Vertical
Water Level:
Start Date & Time: 8/4/18 at 10:01
End Date & Time: 8/4/18 at 17:30
Logged By: M. Tekle/CLT

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R11 44%	32%		60' - 61' No recovery	60' - 61' No recovery	
				TD = 61' bgs End of rock core		
65						
70						
75						
80						
85						
90						

ch2m:	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID EBP-MW10	Sheet 1 of 1
	SOIL BORING LOG		

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP

Weather: NA **Drilling Contractor:** Dakota

Drilling Method and Equipment Used: Geoprobe 6620 DT

Water Level: **Start Date & Time:** 7/9/18 at 16:21 **End Date & Time:** 7/9/18 at 16:43 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	5.0	DP1	CL	0 - 5' - **CL**: lean clay, trace sand and gravel, dark yellowish brown, (10YR 4/6), mottled black and orange, moist, very stiff to stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
5	5-10	5.0	DP2	CL	5 - 10' - **CL**: lean clay, trace sand and gravel, dark yellowish brown, (10YR 4/6), mottled black and orange, moist, very stiff to stiff, sandy clay at bottom 1'	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
10	10-15	4.5	DP3	CH	10 - 15' - **CH**: fat clay, trace sand and gravel, dark yellowish brown, (10YR 4/6), moist, soft at 11 - 11.5' and 13 - 13.5'	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
15	15-20	4.7	DP4	CH	15 - 18' - **CH**: fat clay, trace sand and gravel, dark yellowish brown, (10YR 4/6), moist, stiff	- 0.0 ppm - 0.0 ppm
				SC	18 - 18.5' - SC: sand with clay, fine to coarse grained sand, dark yellowish brown (10YR 4/6), moist, dense	- 0.0 ppm
				CH	18.5 - 19.7' - **CH**: fat clay, trace sand and gravel, dark yellowish brown, (10YR 4/6), moist, stiff	- 0.0 ppm
					19.7 - 20' - No recovery	- 0.0 ppm
20	20-25	1.0	DP5	MH	20 - 21' - **MH**: sandy silt, trace gravel, light yellowish brown, moist, stiff, weathered bedrock	- 0.0 ppm Driller: refusal on bedrock
					21 - 25' - No recovery	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
25					End of boring at 25' bgs	
30						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW11**	Sheet 1 of 1
	SOIL BORING LOG		

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP-MW11

Weather: N/A **Drilling Contractor:** Dakota

Drilling Method and Equipment Used: Geoprobe 6620 DT

Water Level: **Start Date & Time:** 6/10/2018 at 08:25 **End Date & Time:** 6/10/18 at 08:35 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	4.0	DP1	CL	1 - 0.5' - **CL**: lean clay, topsoil, very dark grayish brown, (2.5Y 3/4), moist, soft, trace organics	
					0.5 - 4' - **CL**: lean clay, trace gravel and sand, light gray, (2.5Y 7/2), moist, stiff, weathered bedrock derived from bedrock	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
5					4 - 5' - No recovery	- 0.0 ppm
	5-6	1.0	DP2	GM	5 - 6' - **GM**: silty sandy gravel, light gray, (2.5Y 7/2), moist to dry, dense, weathered bedrock	Driller: refusal at 6' bgs - 0.0 ppm
					End of boring at 6' bgs	
10						
15						
20						
25						
30						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW12**	Sheet 1 of 1

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP-MW11

Weather: N/A **Drilling Contractor:** Dakota

Drilling Method and Equipment Used: Geoprobe 6620 DT

Water Level: **Start Date & Time:** 7/10/18 at 13:05 **End Date & Time:** 7/10/18 at 13:20 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
5	0-5	5.0	DP1	CL	0 - 5' - **CL**: lean clay, trace sand, yellowish brown, (10YR 5/6), mottled black, moist, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm In borehole at 0 - 5': 02 - 18% CO - 40 ppm H2S - 0.0 ppm LEL - 0% VOCs - 14.7 ppm
	5-7	2.0	DP2		5 - 7' - weathered bedrock, (chips of bedrock in macro), white (10YR 8/1), moist to dry, hard with loose sand and silt between chips	- 0.0 ppm - 0.0 ppm In 5' core: 02 - 19.8% CO - 28 ppm H2S - 0.0 ppm LEL - 0% VOCs - 12.3 ppm
10					End of boring at 7' bgs	
15						
20						
25						
30						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW13**	Sheet 1 of 3
	BORING LOG		

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** WBP
Weather: **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic Headquarters **Orientation:** Vertical
Water Level: **Start Date & Time:** 8/6/18 at 06:45 **End Date & Time:** 8/7/18 at 14:20 **Logged By:** L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
5 10 13.5				0 - 13.5' Overburden soil (see DPT soil log from EBP-MW12)		Blind drill overburden EBP-WM12 is soil logged
				Surface casing set to 14' bgs	14' - 17' **LIMESTONE** and **SHALE**.	
15 17	R1 72%	36%	10+ 2 2" rec	14' - 14.3' Fracture zone orientation 0 - 90 degrees, Rough and Undulating, washed out 14.5', 14.8' Fracture orientation 0 degrees, Rough and Undulating, U, discolored and washed out 15.5', 15.95' a ledge of decomposed zones, very soft clay, discolored	14' - 15.4', very light gray (N8) & medium gray (N5), medium grained, mod. Fractured to extremely fractured, slightly weathered, discolored, no apparent bedding, strong to very strong 15.4' - 16.2', medium dark gray (N4), laminated mod. Weathered to completely weathered, extremely to mod. Fractured RO - R1	R1: 08:32 - 08:43 75 gallons used Total loss of water at 15' bgs Core washed out
20	R2 94%	54%	3 2 4	17.1', 17.3', 17.5', 17.8', Fracture orientation 0 degrees, Smooth nd Undulating, dredging and washed out slightly 18.5', Fracture orientation 20 degrees, Rough/Undulating 18.6', Fracture orientation 0 degrees, Rough and Planar 19.1', 19.3', Fracture orientation 0 degrees, Rough and Undulating	17' - 20' **LIMESTONE** at 17' - 17.3' and 19.3' - 19.7' as above. **SHALE** at 17.3' - 19.3, 18.7' - 19.9' as above	R2: 09:21 - 09:32 No return
	R3 21%	21%	4 10+	20.2', 20.3', 20.95', 21.2', Fracture orientation 0 degrees, Rough and Planar 20.7', Fracture orientation 0 degrees, Rough/Undulating at a decomposed zone 21.6' - 22', Fracture zone, orientation 0 - 90% degrees, decomposed, very soft clay	20.4' - 20.8' **LIMESTONE** very light gray (N8) & medium gray (N5), medium grained, mod. Fractured to extremely fractured, slightly weathered, discolored, no apparent bedding, strong to very strong. **SHALE** at 20' - 20.4' and 20.8' - 22, medium dark gray (N4), laminated mod. Weathered to completely weathered, extremely	R3: 09:38 - 09:42 70 gallons used No return
24.4	R4 100%	0%	10+ 10+ 10+	22' - 23', Fracture zone, orientation 0 & 80 degrees, Rough/Undulating, Strong & Planar, discolored, washed out 23.3', 23.7', Fracture orientation 0 degrees, Rough and Undulating 24.0', 24.2' - 24.4', Fracture zone, orientation 0 to 90 degrees, Rough/Undulating, discolored	22' - 24.4' **LIMESTONE** and **SHALE** interbedded as **LIMESTONE** at 20.4' - 20.8' and **SHALE** at 20' - 20.4' shown above	R4: 09:47 - 09:54 70 gallons used No return
25	R5 90%	19%	10+ 10+ 3	24.4' - 26', Fracture zone, orientation 0 - 90 degrees, Rough and Undulating, discolored, washed out 26' 26.3', Fracture orientation 90% degrees, Rough andUndulating, discolored, washed out	24.4' - 27' - **LIMESTONE** as 20.4' - 20.8', moderately weathered	R5: 09:58 - 10:10 70 gallons used No return
30	R6 92%	67%	10+ 4 2	27.3' - 28.3' No recovery 28.3', 28.5', 28.7', 28.8', 29.4', 29.95', 30.8' - 30.9', Fracture orientation 0 degrees, Rough and Undulating, very soft clay and little discoloration	27' - 27.5' decomposed **SHALE** 27.5' - 32' interbedded **LIMESTONE** and **SHALE**, **LIMESTONE** very light gray (N8) & medium gray (N5), medium grained, mod. Fractured to extremely fractured, slightly weathered, discolored, no apparent bedding, strong to very strong. **SHALE** at 20' - 20.4' and 20.8' - 22, medium dark gray (N4), laminated mod. fresh	R6: 10:13 - 10:37 110 gallons No return

	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW13**	Sheet 2 of 3

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP
Weather: **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic Headquarters **Orientation:** Vertical
Water Level: **Start Date & Time:** 8/6/18 at 06:45 **End Date & Time:** 8/7/18 at 14:20 **Logged By:** L. Martin

Feet BGS	Core Run Length and Recovery (%)	Discontinuous: RQD (%)	Discontinuous: Fractures per Foot	Discontinuous: Core Description — Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology — Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments — Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R6 92%	67%	1 0		30' - 32' interbedded **LIMESTONE** and **SHALE**, **LIMESTONE** very light gray (N8) & medium gray (N5), medium grained, mod. Fractured to extremely fractured, slightly weathered, discolored, no apparent bedding, strong to very strong. **SHALE** at 20' - 20.4' and 20.8' - 22, medium dark gray (N4), laminated mod. fresh to slightly weathered	
35	R7 8%	67%	1 1 0 10+ 2	32.3' Fracture orientation 0 degrees, Rough/Undulating 32.7' MB 33.1 Fracture orientation 0 degrees, Rough and Planar 35.2' - 36.1' Fracture zone, orientation 0-90 degrees, Rough and Undulating, washed out 36.7' Fracture orientation 0 degrees, Rough and Undulating	32' - 37' LIMESTONE, light gray (N7) and very light gray (N8), very strong to strong rock, stains in pore space at 35.1', rock has clay layer (70.05' thick), very soft. Laminated to medium beds, unweathered fresh to discolored and slightly weathered.	R7: 10:44 - 10:58 105 gallons used No return
40	R8 100%	80%	10+ 3 1 0 0	37.3' - 37.8' Fracture zone, orientation 0 degrees, Rough and Planar, little clay, broken weathered **SHALE** 38.1', 38.5', 38.9' Fracture orientation 0 degrees, Smooth and Planar 38.1' - 39.15' Fracture zone, orientation 0 degrees, Rough and Planar, little clay, broken weathered **SHALE**	37' - 37.3' as above **LIMESTONE** 37.3' - 42' **SHALE** with **LIMESTONE**, interbeds, medium dark gray (N4) and dark gray (N3), sound to moderately fractured, laminated to thin beds, very weak rock unweathered to moderately weathered	R8: 11:07 - 11:17 105 gallons used No return
45	R9 98%	85%	0 0 1 3 2	44.95' Fracture orientation 0 degrees, Rough/Planar 45.4', 45.6', 45.7', 46.2' Fracture orientation 0 degrees, Smooth/Planar 46.5' Fracture orientation 0 degrees, Rough and Undulating	42' - 47' **SHALE** with **LIMESTONE**, interbeds, medium dark gray (N4) and dark gray (N3), sound to moderately fractured, laminated to thin beds, very weak rock unweathered to moderately weathered	R9: 11:25 - 11:39 95 gallons used No return
50	R10 89%	97%	2 1 1 0 1	47.6, 47.8' Fracture orientation 0 degrees, Rough and Undulating 48.4' Fracture orientation 10 degrees, Rough/Undulating 49.8' Fracture orientation 0 degrees, Rough and Planar 51.7' Fracture orientation 0 degrees, Smooth and Undulating	47' - 52' **SHALE** with **LIMESTONE**, interbeds, medium dark gray (N4) and dark gray (N3), sound to moderately fractured, laminated to thin beds, very weak rock unweathered to moderately weathered, more **LIMESTONE**, trace staining in pores at 48.2' - 49.1', fossils present in rock faces.	R10: 13"09 - 13:20 105 gallons used No return
55	R11 100%	82%	3 2 1 1 1	52.3', 52.6', 52.9' Fracture orientation 0 degrees, Smooth and Planar 53.5' Fracture orientation Rough and Planar 54.0' 54.8' Fracture orientation 0 degrees, Rough and Undulating 55.9' Fracture orientation 20 degrees, Rough and Undulating 56.3' Fracture orientation 0 degrees, Rough and Planar	52' - 53.5' **SHALE**, dark gray (N3), laminated, weak rock, fresh 53.5' - 57' **LIMESTONE**, very light gray (N8) and medium gray (N5), very strong rock, laminated to thin beds, fossils, fresh. At 55.5' - 56.3' there are 1-2mm wide pore spaces	R11: 13:25 - 13:30 Stop to get head for rig at gate 13:33 - 13:38 Wait for Paul and Adam to extract core. 105 gallons used No return
60	R12 3%	88%	1 1 1	57.3', 58.1', 59.3', 61.2' Fracture orientation 0 degrees, Rough and Undulating	57.0' - 59' **LIMESTONE** , very light gray (N8) and medium gray (N5), very strong rock, laminated to thin beds, fossils, fresh. At 55.5' - 56.3' there are 1-2mm wide pore spaces 59.0' - 59.3' very soft light gray (N8) clay 59.3' - 60' **LIMESTONE** as 53.5' - 57.0'	R12: 14:13 - 14:20 Blocked off at 59.5' bgs 14:23 - 14:30 second half of R12 time extracted. 57' - 59.5' continued 105 gallons used No return

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID EBP-MW13

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork
Site Location: EBP
Weather:
Drilling Contractor: Cascade
Drilling Method and Equipment Used: Mini Sonic Headquarters
Orientation: Vertical
Water Level:
Start Date & Time: 8/6/18 at 06:45
End Date & Time: 8/7/18 at 14:20
Logged By: L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R12 3%	88%	0 2	61.8' Fracture orientation at 0 degrees, Rough and Undulation	60.0' - 62' **LIMESTONE** very light gray (N8) and medium gray (N5), very strong rock, laminated to thin beds, fossils, fresh.	Ream out hole to 50' bgs on 8/7/18 and clean out to 62'
65						
70						
75						
80						
85						
90						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW14**	Sheet 1 of 1

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP-MW14
Weather: N/A **Drilling Contractor:** Dakota
Drilling Method and Equipment Used: Geoprobe 6620 DT
Water Level: **Start Date & Time:** 7/10/18 at 09:10 **End Date & Time:** 7/10/18 at 09:25 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	4.5	DP1	CL	0 - 2' - **CL**: lean clay, topsoil, dark grayish brown, (10YR 4/2), moist to dry, soft, organics and roots	- 0.0 ppm - 0.0 ppm
					2 - 4.5' - **CL**: lean clay, trace sand, brown, (10YR 4/3), dry, stiff	- 0.0 ppm - 0.0 ppm
5					4.5 - 5' - No recovery	- 0.0 ppm
	5-10	5.0	DP2	CL	5 - 13.5' - **CL**: lean clay, trace gravel and sand, yellowish brown, (10YR 5/6) and light brownish gray, (10YR 6/2), mottled black and orange, dry to moist, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
10	10-14	4.0	DP3			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
				GM	13.5 - 14' - **GM**: silty gravel, light brownish gray, (10YR 6/2), white (10YR 8/1), dry, very dense, weathered bedrock	- 0.0 ppm Driller: refusal at 14' bgs
					End of boring at 14' bgs	Placed 1" pipe with 5'
15						- 0.0 ppm screen in borehole
20						
25						
30						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW15**	Sheet 1 of 2
	SOIL BORING LOG		

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP
Weather: N/A **Drilling Contractor:** Dakota
Drilling Method and Equipment Used: Geoprobe 6620 DT
Water Level: **Start Date & Time:** 7/10/18 at 10:00 **End Date & Time:** 7/10/18 at 16:15 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	4.5	DP1	CL	0 - 4.5' - **CL**: lean clay, trace gravel and sand, dark yellowish brown (10YR 4/6), and grayish brown (2.5Y 5/2), mottled black and orange, moist, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
5					4.5 - 5' - No recovery	- 0.0 ppm
	5-10	5.0	DP2	CH	5 - 6.5' - **CH**: fat clay, dark yellowish brown, (10YR 4/6), and grayish brown, (2.5Y 5/2), mottled black and orange, wet, soft	- 0.0 ppm
					6.5 - 9.5' - **CH**: fat clay, dark yellowish brown, (10YR 4/6), and grayish brown, (2.5Y 5/2), mottled black and orange, moist, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm
10					9.5 - 10' - **CH**: fat clay, dark yellowish brown, (10YR 4/6), and grayish brown, (2.5Y 5/2), mottled black and orange, wet, soft	- 0.0 ppm
	10-15	5.0	DP3		10 - 14.5' - **CH**: fat clay, dark yellowish brown, (10YR 4/6), and grayish brown, (2.5Y 5/2), mottled black and orange, wet, stiff to soft	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
15					14.5 - 15' - **CH**: fat clay, with 30% sand, dark yellowish brown, (10YR 4/6), and grayish brown, (2.5Y 5/2), mottled black and orange, wet, stiff to soft	- 0.0 ppm
	15-20	5.0	DP4	CL	15 - 18' - **CL**: lean clay, dark yellowish brown, (10YR 4/6), and gray, (2.5Y 6/1), moist, wet, hard	- 0.0 ppm - 0.0 ppm - 0.0 ppm
					18 - 19' - **CL**: lean clay, dark yellowish brown, (10YR 4/6), and gray, (2.5Y 6/1), wet, soft, loose, clayey sand seam 0.05' thick	
20				CH	19 - 20' - **CH**: fat clay, with 30% sand from 19.5-20', dark yellowish brown, (10YR 4/6), and gray, (2.5Y 6/1), moist, wet, hard	- 0.0 ppm - 0.0 ppm
	20-25	5.0	DP5	CL	20 - 24.5' - **CL**: lean clay, dark yellowish brown, (10YR 4/6), and gray, (2.5Y 6/1), moist to wet, hard	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
25				CH	24.5 - 25' - **CH**: lean clay, dark yellowish brown, (10YR 4/6), and gray, (2.5Y 6/1), wet, hard	- 0.0 ppm
	25-30	4.3	DP6	CL	25 - 28.8' - **CL**: lean clay, dark yellowish brown, (10YR 4/6), and gray, (2.5Y 6/1), moist to wet, hard	- 0.0 ppm - 0.0 ppm - 0.0 ppm
				CH	28.8 - 29.3' - CH: fat clay, dark yellowish brown, (10YR 4/6), and gray, (2.5Y 6/1), moist to wet, hard	- 0.0 ppm
30					29.3 - 30' - No recovery	- 0.0 ppm

Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW15**	Sheet 2 of 2

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP
Weather: N/A **Drilling Contractor:** Dakota
Drilling Method and Equipment Used: Geoprobe 6620 DT
Water Level: **Start Date & Time:** 7/10/18 at 10:00 **End Date & Time:** 7/10/18 at 16:15 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	30-35	5.0	DP7	CL	30 - 33' - **CL**: lean clay, trace sand and gravel, olive brown, (25Y 4/3), and dark yellowish brown, (10YR 6/6), moist, very stiff	- 0.0 ppm Placed piezometer with 5' screen in borehole - 0.0 ppm Dry at 13:55, will drill to refusal. - 0.0 ppm 15:45 start at 30' bgs
35					33 - 35' - **CL**: sandy clay, trace sand and gravel, olive brown, (25Y 4/3), and dark yellowish brown, (10YR 6/6), moist, very stiff	- 0.0 ppm - 0.0 ppm
	35-40	2.5	DP8		35 - 37.5' - **CL**: sandy clay, dark yellowish brown, (10YR 4/6), wet, stiff, sand is loose, fine, poorly graded	- 0.0 ppm - 0.0 ppm - 0.0 ppm Driller: refusal at 37.5' bgs
					End of boring at 37.5'	
40						
45						
50						
55						
60						

Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW16**	

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork
Site Location: WBP
Weather:
Drilling Contractor: Cascade
Drilling Method and Equipment Used: Mini Sonic Headquarters Wireless
Orientation: Vertical
Water Level:
Start Date & Time: 8/14/18 at 12:57
End Date & Time: 8/15/18 at 15:56
Logged By: L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
5, 10	0 - 13'	NA		0-13' See EBP-MW14 for overburden description		Surface casing set at 13' bgs
15, 16	R1 81%	26%	10+ 3 10+	13' - 13.3' Clay weathered bedding structure out, soft clay 13.7', 13.95', 14.0', 14.4', 14.5', 14.7', 15.01', 15.2', 15.3' Fracture orientation 0 degrees, Rough and Undulating, discolored, washed out	13.3' - 15.7' **SHALE**, no soil like, washed, **LIMESTONE** very light gray (N8) and medium dark gray (N4), washed out, very thin to thin beds, moderate to very close fracturing, Mod fractured to slightly fractured, slightly weathered, discolored, medium grained 16' - 16.5' same as above trace porosity	R1: 12:57 - 13:09 75 gallons used 100% return
17	R2 50%	38%	1	16.4' Fracture orientation 0 degrees, Rough and Undulating, washed out, discolored		R2: 13:13 - 13:17 35 gallons used 100% return
20	R3 99%	27%	10+ 10+	17.0' - 17.3' Weathered daylike zone. Some bedding 17.8' Fracture orientation 0 degrees, Rough/Undulating 18.1' - 18.4' Weathered daylike zone. Some bedding 18.7', 19.0', 19.3' 19.5', 19.6', 19.8' 20.0', 20.1', 20.3; 20.7', 21.0', 21.2', 21.6' Fractured orientation 0 degrees, Rough and Undulating, washed out	17' - 22' Interbedded **SHALE** and **LIMESTONE**, **LIMESTONE** very light gray (N8) and medium dark gray (N4), washed out, very thin to thin beds, moderate to very close fracturing, Mod fractured to slightly fractured, slightly weathered, discolored, medium grained, SHALE medium dark gray (N4), laminated to thin beds, slightly weathered, soft to medium strong	R3: 13:23 - 13:37 100 gallons used 100% return
	R4 6%	31%	3 10+	22,2', 22.4', 22.0' 23.0', 23.3' Fracture orientation 0 degrees, Rough and Undulating, washed out 23.3' - 23.5' Fracture zone 0 degrees, Rough/Undulating, clayey	22' - 23.5' as above	R4: 13:43 - 13:50 60 gallons 100% return
25	R5 5%	93%	0 3 1 2	24.4', 24.5', 24.6', 25.3' 26.0', 26.5', Fracture orientation 0 degrees, Rough and Undulating, U. washed out.	23.5' - 27' as above, trace porosity throughout, possible washed out areas	R5: 13:57 - 14:06 60 gallons 100% return
30	R6 2%	92%	10+ 1 2	27.4' Fracture orientation 0 degrees, Rough/Undulating 27.4' - 27.7' Fracture zone, claylike material 28.4', 29.3' Fracture orientation 0 degrees, Rough and Undulating 29.4' Fracture zone, orientation 0 degrees, Smooth and Planar	27' - 30' Interbedded **SHALE** and **LIMESTONE**, **LIMESTONE** very light gray (N8) and medium dark gray (N4), washed out, very thin to thin beds, moderate to very close fracturing, Mod fractured to slightly fractured, slightly weathered, discolored, medium grained, SHALE medium dark gray (N4), laminated to thin beds, slightly weathered, soft to medium strong,	R6: 14:48 - 14:47 60 gallons 100% return

ch2m

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID EBP-MW16

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** EBP
Weather: **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic Headquarters Wireless **Orientation:** Vertical
Water Level: **Start Date & Time:** 8/14/18 at 12:57 **End Date & Time:** 8/15/18 at 15:56 **Logged By:** L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R6 2% (con't)	92%	2 1	30.1', 30.8' Fracture orientation 5 degrees, Rough and Planar, clayey 31.3' Fracture orientation 0 degrees, Rough and Undulating	30' - 32' Same as 27' - 30'	Reamed to 30' bgs cleaned out to 40' bgs WL = 11.7' bgs on 8/14/18
35	R7 2%	2%	0 0 0 0 0	All MBs, some washed out along bedding planes	32' - 37' Interbedded **SHALE** and **LIMESTONE**, **LIMESTONE** very light gray (N8) and medium dark gray (N4), washed out, very thin to thin beds, moderate to very close fracturing, Mod fractured to slightly fractured, slightly weathered, discolored, medium grained, SHALE medium dark gray (N4), laminated to thin beds, slightly weathered, soft to medium strong, no pores visible	R7: 15:01 - 15:10 50 gallons 100% return SL= 3.6' bgs on 8/15/18
40	R8 2%	91%	0 0 0 0 0	All MBs, some washed out along bedding planes	37' - 42' Interbedded **SHALE** and **LIMESTONE**, **LIMESTONE** very light gray (N8) and medium dark gray (N4), washed out, very thin to thin beds, moderate to very close fracturing, Mod fractured to slightly fractured, slightly weathered, discolored, medium grained, SHALE medium dark gray (N4), laminated to thin beds, slightly weathered, soft to medium strong, no pores visible	R8: 15:16 - 15:27 50 gallons 100% return
45	R9 97%	92%	0 0 0 0 0	All MBs, some washed out along bedding planes	42' - 47' Interbedded **SHALE** and **LIMESTONE**, **LIMESTONE** very light gray (N8) and medium dark gray (N4), washed out, very thin to thin beds, moderate to very close fracturing, Mod fractured to slightly fractured, slightly weathered, discolored, medium grained, SHALE medium dark gray (N4), laminated to thin beds, slightly weathered, soft to medium strong, no pores visible	R9: 15:30 - 15:40 60 gallons 100% used On 8/15/18 cleaned out to 52' bgs Purged dry and will return to gauge water later in the day or on 8/16/18
50	R10 5%	0.9	0 0 0 0 0	All MBs, washed out from drilling	47' - 52' Interbedded **SHALE** and **LIMESTONE**, **LIMESTONE** very light gray (N8) and medium dark gray (N4), washed out, very thin to thin beds, moderate to very close fracturing, Mod fractured to slightly fractured, slightly weathered, discolored, medium grained, SHALE medium dark gray (N4), laminated to thin beds, slightly weathered, soft to medium strong, no pores visible	R10: 15:46 - 15:56
55				End of boring at 52' bgs		
60						

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID EBP-MW17

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork | **Site Location:** WBP
Weather: | **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: | **Orientation:** Vertical
Water Level: | **Start Date & Time:** 8/5/18 at 11:43 | **End Date & Time:** 8/5/18 at 16:47 | **Logged By:** M. Tekle/CLT

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
5, 6.5				0' - 6 1/2' bgs See Boring Log EBP-MW11 for overburden description		
7.5	R1 100%	0%	10+	6.8', 7.0', 7.2' - 7.5' Fracture zone, moderately weathered, few yellowish red staining	6.5' - 7.5' **LIMESTONE** with few clay, yellowish gray, (5& 7/2), fine grained, moderately to highly weathered, medium to very weak	R1: 13:05 - 13:12 30 gallons 100% return
10	R2 100%	50%	10+, 3, 1, 3	7.5' - 7.8' Fracture zone 8.0' Fracture orientation 0 degrees, Rough/Planar, moderately weathered, few yellowish red staining 8.8', 9.0' Fracture along Shale layer, moderately to highly weathered, orientation 0 degrees, Rough/Planar 9.3', 9.5' Fracture along Shale bedding, orientation 0 degrees, Rough/Planar 9.8' Fracture orientation 0 degrees, Rough/Planar 10.6', 10.8' Fracture orientation 0 degrees, Rough/Undulating 11.0' Fracture orientation 35%, Rough/Undulating, yellowish orange staining	7.5' - 11.5' **LIMESTONE** with **SHALE** layers at 8.8' - 9.0', 10.2' - 10.5', yellowish gray (5Y 7/2), very light gray (N8), medium dark gray (N4), fine to medium grained, slightly to highly weathered, strong to very weak	R2: 13:15 - 13:25 90 gallons 100% return
15, 16.5	R3 100%	71%	2, 4, 3, 3, 2	11.8', Fracture orientation 0 degrees, Rough and Planar 12.2' Fracture orientation 25 degrees, moderately healed. 12.5' Fracture orientation 0 degrees, Rough/Planar, moderately weathered 12.8' - 13.1' Fracture zone, highly to moderately weathered 13.5' Fracture orientation 0 degrees, Rough/Planar 13.7', 13.9', 14.1' Fracture orientation 0 degrees, Rough/Planar 14.6' Fracture along Shale bedding, fracture orientation 0 degrees, Rough/Planar 15.1', 15.5', 15.8', 15.9' Fracture along Shale bedding, orientation 0 degrees, Rough and Planar	11.5' - 14.6' SAA 14.6' - 16.5' **SHALE**, medium dark gray, (N4), very fine grained, slightly weathered, moderately strong	R3: 13:28 - 13:43 105 gallons used 100% return to 13' bgs and lost return 13' - 14' bgs and 50% return
20, 21.5	R4 94%	63%	0, 4, 0, 2, 3	17.8', 17.9', 18.1', 18.4' Fracture orientation 0 degrees, Rough and Planar 19.2' Fracture orientation 0 degrees, Rough/Planar 19.8', 20.1' 20.3' 20.5' Fracture orientation 0 degrees, Rough and Planar	16.5' - 21.5' SAA	R4: 13:52 - 14:05 110 gallons No return
25, 26.5	R5 100%	73%	2, 2, 1, 1, 0	21.7', 22.4' Fracture orientation 0 degrees, Rough/ Undulating 22.9' Fracture orientation 25 degrees, Rough/Planar 23.3' Fracture orientaiton 0 degrees, Rough/Planar 24.0' Fracture along Shale bedding, orientation 0 degrees, Rough/Planar 24.6' Fracture	21.5' - 24' **SHALE** interbedded with **LIMESTONE**, medium dark gray (N4), light gray (N7), very fine grained, slightly weathered, medium strong 24' - 26.5' **LIMESTONE**, very light gray (N8), fine to medium grained, slightly weathered, strong	R5: 14:10 - 14:18 85 gallons No return
30	R6 100%	86%	1, 1, 1	27.0', Fracture orientation 15 degrees, Rough/Undulating 27.8' Fracture along Shale bedding, orientation 0 degrees, Rough/Planar	26.5' - 30.1' SAA, few **SHALE** layers	R6: 14:25 - 14:35 100 gallons No return

ch2m:	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **EBP-MW17**	Sheet 2 of 2
	BORING LOG		

Project: Iowa Army Ammunition Plant RI Fieldwork | **Site Location:** EBP
Weather: | **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: | **Orientation:** Vertical
Water Level: | **Start Date & Time:** 8/5/18 at 11:43 | **End Date & Time:** 8/5/18 at 16:47 | **Logged By:** M. Tekle/CLT

Feet BGS	Core Run Length and Recovery (%)	Discontinuous: RQD (%)	Discontinuous: Fractures per Foot	Discontinuous: Core Description — Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology — Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments — Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
31.7	R6 100%	86%	3 3	30.1' Fracture orientation 0 degrees, Rough/Planar 30.2, 30.3' Fracture along Shale bedding, orientation 0 degrees, Smooth/Planar 30.9' Fracture orientation 45 degrees, Rough/Undulating 31.5' Fracture orientation 0 degrees, Smooth/Planar; 31.6' Fracture orientation 0 degrees, Rough/Planar	30.1' - 31.7' **SHALE**, medium dark gray (N4), very fine grained, slightly weathered, medium strong	
35 36.5	R7 100%	95%	0 3 0 1 0	32.7' Fracture orientation 45 degrees, Rough/Planar 33.3', 33.5' Fracture orientation 0 degrees, Rough/Planar 34.9' Fracture orientation 0 degrees, Rough/Planar	31.7' - 36.5' **LIMESTONE** with **SHALE** layers at 32.2', 32.4', 32.7', 32.9' - 33.7' interval, very light gray (N8) to medium gray (N5), very fine to medium grained, slightly weathered, medium to strong	R7: 14:42 - 14:56 125 gallons No return
37.2	R8 100%	0%	3	36.8', 36.9', 37.0' Fracture zone, moderately to highly weathered	36.5' - 37.2' **LIMESTONE** with **SHALE** and clay, very light gray (N8)	R8: 15:02 - 15:08 30 gallons and no return
40 41.2	R9 85%	70%	0 2 2 1	38.3', 38.4' Fracture orientaiton 20 degrees, Rough/Planar 39.5' 39.6' Fracture orientation 0 degrees, Rough/Undulating 40.3' Fracture orienation 0 degrees, Rough and Planar	37.2' - 41.2' **LIMESTONE** with few **SHALE** layers, very light gray (N8) to light gray (N7), fine to medium grained, slightly weathered, strong	
45	R10 92%	83%	0 3 0 0	42.2' Fracture orientation 25 degrees, Rough/Planar 42.5' Fracture along Shale bedding, orientation 0 degrees, Rough/Planar 42.8' Fracture orientation 0 degrees, Rough/Planar	41.2' - 45' SAA	R10: 15:40 - 16:00 95 gallons No return
46.5	R11 89%	56%	3	45.5', 45.7' Fracture orientation 25 degrees, Rough/Planar 46.1' Fracture orientation 45 degrees, Rough/Planar 46.3' Fracture orientation 30 degrees, Rough/Planar	45' - 46.5' **LIMESTONE**, very light gray (N8) to light gray (N7), fine to medium grained, slightly weathered, strong	R11: 16:05 - 16:12 60 gallons No return
50	R12 100%	95%	1 1 1 2	47.2 Fracture orientation 0 degrees, Rough/Undulating 47.5' Fracture orientation 5 degrees, Rough/Planar 49.0', 49.3' Fracture orientation 0 degrees, Rough/Planar 50.3', 50.8' Fracture orientation 0 degrees, Rough/Planar	46.5' - 51' SAA, few por space on the surface at 50.8' - 51' bgs	R12: 16:18 - 16:47 140 gallons No return
55				TD = 51' End of rock core		
60						

ch2m:

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **JAW-06R**	Sheet 1 of 1

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** East Burn Pad
Weather: high 40s to low 50s, cloudy **Drilling Contractor:** Roberts
Drilling Method and Equipment Used: 6" hollow stem auger with split spoon soil sampling/Geoprobe 8040 DT
Water Level: N/A **Start Date & Time:** 5/12/2020 at 07:30 **End Date & Time:** 5/12/2020 at 09:25 **Logged By:** Dave Kortjohn

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	HA	1	CL CL	0 - 1' - **CL:** Topsoil and lean clay, black, moist, some organics/wood from trees 1 - 5' - **CL:** Lean clay, brown, moist, soft, little medium gravel, trace fine sand, trace wood from trees	0.0 ppm 0.0 ppm 0-5' - Advanced with hand auger
5	5-7	0.5	2	CL	5 - 7' - **CL:** Lean clay, brown, moist, soft, few fine gravel, trace black mottles, trace fine sand, trace wood from trees	0.0 ppm
	7-9	0.6	3	CL	7 - 9' - **CL:** Lean clay, brown, moist, soft to medium stiff, trace black mottles, trace fine sand	0.0 ppm
10	9-11	1.8	4	CL	9 - 11' - **CL:** Lean clay, light brown, moist, stiff, trace black mottles, trace fine gravel, trace fine sand	0.0 ppm
	11-13	0.9	5	CL CL	11 - 12' - **CL:** Lean clay, light brown, moist, stiff, trace black mottles, trace fine gravel, trace fine sand 12 - 13' - **CL:** Lean clay, brown, moist, soft, few fine sand, little fine gravel, trace cobble	0.0 ppm 0.0 ppm
	13-15	0.7	6	CL	13 - 15' - **CL:** Lean clay, greyish brown, moist, stiff, trace fine sand, trace fine gravel	0.0 ppm
15	15-17	1.1	7	CL	15 - 17' - **CL:** Lean clay, grey, moist, stiff, little black mottles, trace fine sand, trace fine gravel	0.0 ppm
	17-19	0.0	N/A	N/A	17 - 19' - No sample recovery	
20	19-21	1.4	8	CL	19 - 21' - **CL:** Lean clay, grey, moist, stiff, trace fine sand, trace fine gravel	0.1 ppm
	21-23	2.0	9	CL	21 - 23' - **CL:** Lean clay, grey, moist, stiff, trace fine sand, trace fine gravel	0.1 ppm
	23-25	1.3	10	CL	23 - 25' - **CL:** Lean clay, grey, moist, stiff, trace fine sand, trace fine gravel	0.0 ppm
25	25-27	1.9	11	CL	25 - 27' - **CL:** Lean clay, grey, moist, stiff to soft at bottom, trace fine sand, trace fine gravel	0.0 ppm
	27-28	N/A	N/A	N/A	27 - 28' - No sample collected	
30					End of boring at 28'	

ch2m: Groundwater Sampling Form

Project Name:
Sample Source (Well No./Location): EBP-4
Weather Conditions: Sunny, 90
Well Condition: overgrown, need paint
Sample Team: J. Hansen
Sample Equipment: Hurricane pump

Project Number:
Date: 7/12/18

Sheet 1 of 1

Water Quality Parameter Information

Datum:
Well Depth: 50 (ft)
Static Water Level: 33.60 (ft)
Water Column: 16.4 (ft)
Diameter/Type: 2" PVC

Well Volume:
1V = 2.7 (gal)

Time Purging begins (T_0) 1237
Water Level at time T_0 33.60
Time Purging ends (T_1) 1307
Water Level at time T_1

Time	Volume Removed ~~(L)~~ gal	pH ±0.1	SPCOND.(mS/cm)[c] ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±0.5	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) <50	Appearance
1237	0.25	7.42	0.649	22.26	137.1	N/A	3.16	20.1	Clear
1242	1.25	7.48	0.675	14.64	102.0	N/A	3.71	651	Strong brown
1245	2.5	7.52	0.690	14.57	103.6	N/A	2.82	>1000	" "
1250	3.5	7.55	0.699	14.60	104.1	N/A	2.78	>1000	" "
1254	4.5	7.58	0.708	14.65	104.5	N/A	2.08	>1000	" "
1300	6.5	7.67	0.702	14.56	107.2	N/A	1.65	>1000	" "
1303	7.25	~~7.9~~ 7.67	0.705	14.51	108.1	N/A	1.55	>1000	" "
1307	8.0	7.65	0.703	14.48	107.7	N/A	1.58	>1000	" "

Sample Information

Sample ID: ~~EBP 4-0718~~ EBP MW4-0718
Analysis: Explosives
Date: 7/12/18
Time: 1310
Field Filtering: No Filter Type N/A
Laboratory: Method of Shipment:
Remarks:

ch2m: Groundwater Sampling Form

Project Name:
Sample Source (Well No./Location): EBP-MW5
Weather Conditions: Sunny, 91°
Well Condition: Overgrown, need paint
Sample Team: J Hansen, W. Conway
Sample Equipment: Bailer

Project Number:
Date: 7/12/18

Water Quality Parameter Information

Datum:
Well Depth: 50 (ft)
Static Water Level: 33.75 (ft)
Water Column: 16.25 (ft)
Diameter/Type: 2" PVC

Well Volume:
1V = 2.65 gal (gal)

Time Purging begins (T_o) 1358
Water Level at time T_o 33.75
Time Purging ends (T_1) 1420
Water Level at time T_1 Dry

Time	Volume Removed ~~#~~ gal	pH ±0.1	SPCOND.(mS/cm)[c] ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±0.5	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) <50	Appearance
1358	0.5	7.71	0.678	17.05	77.6	N/A	1.19	375	
1400	1.75	7.26	0.742	14.81	92.6	~~N/A~~ 38.16	0.94	415	
1408	3.25	7.26	0.792	13.99	113.9	N/A	1.86	>1000	
1413	5.0	7.06	0.751	13.90	121.7	N/A	1.80	>1000	
1420	7	6.99	0.566	12.98	130.6	N/A	3.07	>1000	
	* Dry at ~8 gallons, let recharge 20 minutes, then sampled								

Sample Information

Sample ID: EBP-MW5-0718
Analysis: Explosives
Date 7/12/18
Time 1440
Field Filtering: No Filter Type
Laboratory: Method of Shipment:
Remarks:

h2m

Groundwate. ampling Form

Project Name: IAAAP RI
Sample Source (Well No./Location): EDA-4
Weather Conditions: Partly Cloudy, 83°
Well Condition: Broken hinge
Sample Team: J. Hansen
Sample Equipment: Peristaltic

Project Number: 679172
Date: 6/24/18

Sheet 1 of 1

Water Quality Parameter Information

Datum:
Well Depth: 21.10 (ft)
Static Water Level: 8.89 (ft)
Water Column: 12.21 (ft)
Diameter/Type: 4"

Equipment Well Volume:
1V = ~0.5L (gal)

Time Purging begins (T_0) 1635
Water Level at time T_0 8.89
Time Purging ends (T_1) 1700
Water Level at time T_1 9.30

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm)^c ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±0.5	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) <50	Appearance
1640	0.8	7.10	0.76	15.5	177.6	8.99	1.01	12.2	175 ml/min to 100 ml/min
1645	1.3	7.11	0.76	15.7	171.9	9.10	0.54	9.85	
1650	1.8	7.11	0.76	15.5	166.4	9.14	0.36	7.65	
1655	2.3	7.12	0.76	15.3	163.8	9.21	0.29	14.2	
1700	2.8	7.13	0.76	15.4	159.3	9.30	0.27	8.85	

Sample Information

Sample ID: EDA-4-0618
Analysis: Explosives
Date: 6/24/18
Time: 1705
Field Filtering: None Filter Type —
Laboratory: Method of Shipment:
Remarks: Low Flow method, pump intake mid-screen

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

done @ 1634

Well Number: EBP-MW2		Site: IAAAP EBP	
Field Crew: Lora Pndi		Date: 3/7/19	Project #:

Well Depth (ft.): 146.6
DTW (ft.): 43.72
Water Column (ft.): 102.88
Well Diameter (in.): 2
Gal. per ft.: .163
Well Volume (gal.):

Purge Methodology: hurricane pump

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

		Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
		Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
	Initial	1528	43.73			6.31	9.5°C	0.122	169.6	2.38	25.3	
Turned up volts to 14.2		1535	43.83			6.02	10.6	0.108	179.4	1.10	19.1	
		1538	43.85			6.01	10.8	0.108	180.6	0.99	18.3	
		1541	43.91			6.01	11.1	0.109	182.1	0.94	16.6	
Turned volts up to 14.9V		1544	43.93			6.06	11.2	0.119	135.2	0.87	21.1	
		1547	43.96			6.36	11.3	0.255	37.0	0.61	45.4	
		1550	43.97			6.71	11.4	0.521	-65.7	0.51	39.5	
15.3V		1555	44.01			6.73	11.5	0.519	-78.8	0.46	143	
16.0V		1600	44.01			6.71	11.6	0.540	-85.8	0.34	74.8	
		1608	44.09			6.71	11.6	0.535	-85.6	0.36	36.2	
		1611	44.10			6.74	11.7	0.578	-91.2	0.36	39.7	
	Post-Purge	1616	44.12	Total:	10gal	6.77	11.7	0.610	-97.0	0.25	35.5	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

begin @ 1528

hurricane pump @ ~~13.8~~ 14.0 V

sample @ 1630

SAMPLING

Depth to Water Before Sampling: 43.73
Sample Methodology: hurricane pump
Sample Name: EBP-MW2-0319 QC Sample:
Sample Date/Time: 3/7/19 1630
Sampler / Signature: Lora Pndi
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: explosives, arsenic

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW3		Site: EBP IAAAP	
Field Crew: Joshua Hansen		Date: 3/6/19	Project #: 679172CH.01.02.DP.01

Well Depth (ft.): 27.50
DTW (ft.): 6.45
Water Column (ft.): 21.05
Well Diameter (in.): 2"
Gal. per ft.: 0.163
Well Volume (gal.): 3.4

Purge Methodology: Low-Flow

Water Quality Meter: C-103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1615	6.45	—	0							
	1618	6.51	variable	0.2	6.87	9.0	0.552	70.6	4.29	10.2	
	1621	6.58	150	0.3	7.09	7.9	0.539	78.8	4.25	9.87	
	1624	6.64	150	0.4	7.14	7.7	0.532	82.2	4.18	7.01	
	1627	6.72	150	0.5	7.16	8.0	0.518	86.5	4.05	8.18	
	1630	6.78	150	0.6	7.14	8.0	0.517	92.0	4.04	8.73	
Post-Purge											

Remarks: Pump Intake Depth: NA Control Box Setting (Hz): NA Sampling: (Sample at 100-250 ml/min)

Tubing: 25 ft bgs

SAMPLING

Depth to Water Before Sampling: 6.78
Sample Methodology: Low Flow, Peristaltic pump
Sample Name: EBP-MW3-0319 & EBP-MWF3-0319 QC Sample: FD EBP-MWF3-0319
Sample Date/Time: 3/6/2019 1635
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: NA
Sample Observations:
Parameters: Explosives, Arsenic

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW6

Field Crew: Lora Pride

Site: IAAAP EBP

Date: 3/7/19

Project #:

Well Depth (ft.): 78.15

DTW (ft.): 22.68

Water Column (ft.): 55.47

Well Diameter (in.): 2in.

Gal. per ft.: .163

Well Volume (gal.): 9.04

Purge Methodology: low flow

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1020	22.30	~200mL		7.01	7.6	0.710	242.1	2.74	6.57	
	1024	22.91			6.97	8.0	0.735	236.4	1.18	2.83	
	1029	23.61			6.95	7.6	0.737	229.4	0.98	2.79	
	1031	23.95			6.94	7.2	0.738	226.1	1.45	1.[illegible]	
	1037	24.39			6.94	7.3	0.734	222.3	1.13	2.09	
	1040	24.85			6.95	8.1	0.731	218.7	0.99	1.02	
			Total	: 2 GAL							
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

low flow started at 1017

Sample @ 1045

SAMPLING

Depth to Water Before Sampling: 22.68

Sample Methodology: low flow

Sample Name: EBP-MW6-0319 QC Sample: —

Sample Date/Time: 3/7/19 1045

Sampler / Signature: Lora Pride

Filtered Metals Collected: Y / N Filter Size:

Sample Observations:

Parameters: explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW7	**Site:** EBP IAAAP
Field Crew: Joshua Hansen	**Date:** 3/6/19 **Project #:**

Well Depth (ft.): 57.32
DTW (ft.): 25.09
Water Column (ft.): 32
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.): 5.2

Purge Methodology: 3 well volume

Water Quality Meter: # C103142 YSI Quatro

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1225	25.90									moderate odor
	1237	30.00	250	1.5	7.24	11.0	0.73	-102.0	9.45	7.53	Bubbles in line
	1250	~~38.95~~ 33.95	250	2.5	7.26	11.0	0.70	-74.7	5.11	7.21	
	1303	38.00	250	3.25	7.65	10.8	0.677	-52.8	8.79	6.03	Bubbles in line
	1315	39.85	250	4.00	7.80	10.3	0.639	-67.7	105.3	17.7	" "
	1327	44.11	200	4.5	7.63	10.1	0.394	-46.8	10.1	9.81	" "
	1337	45.89	200	5	7.18	10.9	0.572	-53.3	9.87	8.03	" "
	1350	47.01	100	5.25	7.25	10.7	0.413	-60.1	9.01	10.6	" "
	1352	Dry	at		5.25	gallons					
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

Well recharged overnight, 3/7/19 DTW = 43.60' BTOC
slow recharge, sample w/ bailer for explosives

SAMPLING

Depth to Water Before Sampling: 43.60
Sample Methodology: Bailer
Sample Name: EBP-MW7-0319 QC Sample: ——
Sample Date/Time: 3/7/19 1420
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: N/A
Sample Observations:
Parameters: Explosives

ch2m:

DC Volt meter

(1)

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW-9		Site: JAAAP EBP	
Field Crew: Lora Pride		Date: 3/8/15	Project #:
Well Depth (ft.): 62.9	Purge Methodology: hurricane pump	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 32.08			
Water Column (ft.): 30.82			
Well Diameter (in.): 2in			
Gal. per ft.: .163	Water Quality Meter: C-103140		
Well Volume (gal.):			

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at ~~200-500~~ 410		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	hydrocarbons
Initial	~~31.69~~	~~31.69~~									smell
	0941	33.66	150		6.95	8.4	0.710	182.7	4.03	10.1	
	0945	34.66			6.93	8.7	0.713	175.8	4.50	7.68	
	1020	33.29			7.07	9.4	0.720	4.2	3.11	16.5	
	1130	35.25									
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

pump stopped; removed tubing, re-measured and cut a longer one; reinserted hurricane pump

SEE NEXT PAGE ***

pump re-started at 1020

SAMPLING

Depth to Water Before Sampling: 32.08
Sample Methodology: hurricane pump
Sample Name: EBP-MW-9-0319 QC Sample:
Sample Date/Time:
Sampler / Signature: Lora Pride
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: arsenic + explosives

941-243 3930

941-322-8504 proactive environmental products ch2m: cut 3rd piece of tubing

(2)

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW-9
Site: IAAAP EBP
Field Crew: Lora Pndi
Date: 3/8/19 Project #:
Well Depth (ft.): 62.9
Purge Methodology: hurricane pump
DTW (ft.): ~~35.57~~ 32.08' (tic)
Water Column (ft.): ~~27.33~~ 30.82'
Well Diameter (in.): 2
Gal. per ft.: .163
Well Volume (gal.): 5.02 gal
Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	hydrocarbon smell
11.3V Initial	(tic)	34.44			7.17	9.3	0.74	-103.6	2.75	163	
	1208	36.51	250								
	1213	38.13	150		7.20	9.8	0.74	-112.2	0.83	230	
	1217	38.85	150		7.20	9.7	0.73	-111.8	0.99	266	
12.3V	1220	39.59	150		7.21	9.6	0.73	-111.8	0.72	227	
	1223	40.43	200		7.22	10.1	0.73	-111.8	0.63	200	
	1227	41.22	150		7.21	10.2	0.72	-112.8	0.55	175	
12.7V	1230	41.89	125		7.22	10.1	0.72	-114.9	0.50	115	
	moved pump up ~1 foot										
13.2V	1237	43.64	125		7.22	9.8	0.72	-118.2	0.47	69	
	1241	44.11	—		7.21	10.0	0.72	-119.7	0.43	54.8	
14.3V Post-Purge	1244	44.52	125		7.21	9.6	0.72	-120.9	0.42	97.6	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

1258 46.70 — 7.20 9.6 0.71 -120.2 0.40 47.5

pump started @ 1206

1247 45.09 100 7.21 9.3 0.72 -121.1 0.41 81.4

1250 46.13 100 7.21 9.2 0.711 -120.7 0.40 63.1

SAMPLING

Depth to Water Before Sampling: 35.57
Sample Methodology: hurricane pump
Sample Name: EBP-MW-9-0319
QC Sample: —
Sample Date/Time: 03/08/19 ~~1300~~ (tic) 1310
Sampler / Signature: Lora Pndi
Filtered Metals Collected: Y (N) Filter Size:
Sample Observations:
Parameters: arsenic & explosives

1300 46.93 — 7.20 9.8 0.71 -119.8 0.39 47.0

1302 47.57 200 7.20 10.2 0.71 -118.6 0.38 38.7

Parameters stable
Samples collected @ 1310

3/8/19 x x x

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EPB-MW13
Field Crew: Lora Pnde
Well Depth (ft.): 63.4
DTW (ft.): 23.22
Water Column (ft.): 40.18
Well Diameter (in.): 2
Gal. per ft.: .163
Well Volume (gal.): 6.55 gal

Purge Methodology: peri pump

Water Quality Meter: C-103140

Site: IAAAP EBP
Date: 3/8/19
Project #:

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1430	23.73	150		7.31	9.6	0.663	-80.6	0.53	20.1	
	1433	24.68	125		7.29	9.9	0.663	-89.3	0.40	19.1	
	1436	25.06	125		7.28	10.0	0.660	-90.8	0.40	18.1	
	1439	25.73	150		7.27	10.2	0.661	-91.7	0.38	19.2	
	1442	26.22	150		7.28	10.1	0.662	-93.3	0.35	18.8	
	1445	26.83	150		7.28	10.2	0.663	-94.3	0.32	17.8	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

low flow started at 1427
parameters stable @1448
collecting Samples for VOC 1st w/ straw method @1455

SAMPLING

Depth to Water Before Sampling: 23.22
Sample Methodology: peri pump
Sample Name: EPB-MW13-0319
QC Sample: —
Sample Date/Time: 3/8/19 1455
Sampler / Signature: Lora Pnde
Filtered Metals Collected: Y / N (N circled) Filter Size:
Sample Observations:
Parameters: VOCs and explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW15		**Site:** EBP IAAAP	
Field Crew: Jestina Hansen		**Date:** 3/7/19	**Project #:**

Well Depth (ft.): 40.04
DTW (ft.): 11.28
Water Column (ft.): 28.76
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.): 4.7

Purge Methodology: Peristaltic

Water Quality Meter: # C-103142 YSI Quatro

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0832	11.28	0	0	—	—	Initialize	purge	—	—	—
	0837	13.42	variable	0.5	7.64	9.9	0.680	216.2	6.74	2.83	130 ml/min from 0837 to 0840.
	0840	13.58	130	0.6	7.51	9.8	0.666	217.3	6.42	3.17	↑ flow rate to stress well
	0856	18.72	variable	2.25	7.75	9.6	0.683	207.5	612	1.72	↓ rate at 0856 to check recharge
	0859	18.62	150	2.3	7.69	9.0	0.666	213.0	5.80	0.93	
	0903	18.62	150	2.4	7.71	9.0	0.670	210.1	5.79	2.58	
	0907	18.62	150	2.5	7.64	8.9	0.672	210.9	5.71	2.22	
Post-Purge											

Remarks:

Pump Intake Depth: 35 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 150 ml/min

SAMPLING

Depth to Water Before Sampling: 18.62
Sample Methodology: Peristaltic, Low Flow
Sample Name: EBP-MW15-0319 QC Sample: —
Sample Date/Time: 3/7/19 0910
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: N/A
Sample Observations:
Parameters: Explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW16	Site: EBP
Field Crew: Joshua Hansen	Date: 3/7/19 Project #:

Well Depth (ft.): 37.50
DTW (ft.): 29.04
Water Column (ft.): 8.46
Well Diameter (in.): 2"
Gal. per ft.: 0.163
Well Volume (gal.): 1.4

Purge Methodology: Hurricane Pump

Water Quality Meter:

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Purge Begin 1519

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1519	30.30	variable	0.5	7.28	10.7	0.369	15.0	8.00	132	Light tan
	1521	34.78	variable	1.5	7.24	11.7	0.342	25.2	2.45	178.1	
	1523	36.50	variable	2.5	7.21	11.5	0.338	31.7	1.97	169.9	
	1524	Dry at 3 gallons. Since there was some									
		recharge, wait 15-20 minutes then collect sample.									
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling:
Sample Methodology: Hurricane Pump
Sample Name: EBP-MW16-0319 QC Sample: —
Sample Date/Time: 3/7/19 1545
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: N/A
Sample Observations: Collection Complete 1610 Total flow 4 gallons Sample is turbid
Parameters: Explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EDA-1	**Site:** CBL
Field Crew: J. Hansen, Dean Johnson	**Date:** 3/8/19 **Project #:**

Well Depth (ft.): 28.8
DTW (ft.): 5.35
Water Column (ft.):
Well Diameter (in.): 4
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Peristaltic low-flow

Water Quality Meter: * C-103142 YSI ◻ C-163190 Hach

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin purge 0903

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0908	5.80	400	0.5	7.52	9.3	0.651	165.8	4.11	4.34	Reduce rate
	0911	5.83	150	0.6	7.55	8.8	0.652	165.0	3.56	3.97	
	0914	5.82	150	0.75	7.56	8.6	0.650	163.5	3.01	3.26	
	0917	5.82	150	0.9	7.56	8.9	0.651	161.3	2.80	3.71	
	0920	5.83	150	1	7.56	9.3	0.648	158.9	2.68	3.18	
	0923	5.83	150	1.1	7.57	9.0	0.649	158.1	2.66	2.50	
Post-Purge											

Remarks: Pump Intake Depth: 25 ft Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

PID BZ = 0.0 ppm

SAMPLING

Depth to Water Before Sampling: 5.83
Sample Methodology: Peristaltic
Sample Name: EDA-1-0319 QC Sample: NA
Sample Date/Time: 3/8/19 0925
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size:
Sample Observations: Clear
Parameters: Explosives

* No lid on steel casing, no caps on holes in bladder pump assembly. Well needs proper covering installed.

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

1305 - 1639

Well Number: EDA - 2

Field Crew: Jestina Hansen, Lora Pride

Site: EBP

Date: 3/6/19   Project #: 679172CH.01.02.DP.01

Well Depth (ft.): ~~[illegible]~~ 29.6

DTW (ft.): 19.94 ft

Water Column (ft.): 9.66

Well Diameter (in.): 4 in

Gal. per ft.: ~~[illegible]~~ .653

Well Volume (gal.): 6.30798

Purge Methodology: PERI PUMP LOW-FLOW

Water Quality Meter: C103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

3800 ml = 1 gal

Field Parameters

	Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1311	20.12	150	0.5	7.05	9.1	0.97	201.2	2.37	2.60	
	1314	20.24	100	0.6	7.00	8.5	0.97	197.0	1.02	2.07	
	1322	20.33	100	0.8	~~7.03~~	~~8.5~~	~~0.97~~	194.0	0.84	1.46	
	~~1329~~	~~20.57~~			~~7.08~~	~~10.3~~	~~0.97~~	~~185.7~~	~~1.86~~		
	1341	20.89	250	2.05	7.06	10.2	0.97	184.4	0.74	1.83	
	increased flow rate				~~7.08~~	~~10.7~~	~~0.97~~	~~181.3~~	~~0.73~~		
	1351	21.38	350	2.97	7.08	10.7	0.97	181.3	0.73	1.65	
	1401	21.94	350	3.89	7.04	10.7	0.97	187.6	0.81	1.32	
	1411	22.54	350	4.81	7.05	10.7	0.97	187.2	0.78	7.71	
	1421	23.50	125	5.14	7.02	9.9	0.97	191.2	0.81	5.05	
	1431	23.30	125	5.47	7.01	10.1	0.97	176.6	0.79	4.77	
Post-Purge	1436	23.40	125	5.63	7.02	9.8	0.97	183.0	0.77	2.08	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

- drawing down w/ low flow, switching to 3V
back to low flow

1439	23.46	125	5.73	7.02	9.8	0.97	180.0	0.77	1.43
1441	23.55	125	5.83	7.01	9.8	0.97	179.4	0.72	1.55

SAMPLING

Depth to Water Before Sampling: 23.55

Sample Methodology: Peristaltic low flow

Sample Name: EDA-2-0319

Sample Date/Time: 3/6/19 1450

QC Sample: MS/MSD

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N (N circled)   Filter Size: N/A

Sample Observations:

Parameters: Explosives, arsenic

ch2m:

TD - DTW = Water column

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-07	Site: EBP
Field Crew: L. PRIDE, R. CAIRD	Date: 3/7/2019 Project #: 679172CH.01.02.DP.01

Well Depth (ft.): 23.11
DTW (ft.): 8.2
Water Column (ft.): 14.91
Well Diameter (in.): 2
Gal. per ft.: .163
Well Volume (gal.): 2.4

Purge Methodology: low flow

Water Quality Meter: Q-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	830	8.41	~300		6.74	9.1	0.425	219.4	2.39	49.2	
	835	8.78			6.78	8.9	0.435	203.1	0.83	52.2	
	840	8.98			6.78	8.7	0.427	196.5	0.71	41.3	
	845	9.11			6.78	8.6	0.430	188.1	0.67	34.7	
	848	9.21			6.78	8.8	0.431	180.6	0.66	22.5	
	852	9.30			6.82	8.7	0.435	178.6	0.65	31.4	
			Total purged	~2 gal							
Post-Purge											

Remarks: Pump Intake Depth: ~20 ft btoc Control Box Setting (Hz): NA Sampling: (Sample at 100-250 ml/min) ~ ~~150-200~~ 300 ml/min

Total purged ~ 2 gal.

SAMPLING

Depth to Water Before Sampling: 8.2
Sample Methodology: low flow peri pump
Sample Name: JAW-07-0319 QC Sample: —
Sample Date/Time: 03/07/19 0900
Sampler / Signature: Lori Pride
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: explosives

ch2m

RESAMPLE : VOCs

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW13		Site: EBP	
Field Crew: ~~R. CAIRD~~		Date: 3/25/2019	Project #: 679172CH 01.02.DP.01
Well Depth (ft.): 63.4	Purge Methodology:	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
DTW (ft.): 19.53	LOW-FLOW	2" / .163	5" / 1.020
Water Column (ft.):	~~PERI PUMP~~	3" / .367	6" / 1.469
Well Diameter (in.): 2	Bladder Pump	4" / .653	8" / 2.611
Gal. per ft.: 0.163	Water Quality Meter:		
Well Volume (gal.):	C103142		

Begin 0900

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. (Surface) (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0907	24.13	400	0.5	7.46	11.7	0.667	-150.7	1.37	~~NM~~ 102	
	0931	37.18	400	3	7.49	11.6	0.665	-150.1	0.23	68.1	↓ rate to check recharge
	0935	37.40	100	3.1	7.49	11.6	0.665	-149.7	0.16	66.3	↑ rate
	1008	53.52	100	6.3	7.50	11.2	0.671	-138.3	0.17	40.2	
	1011	53.52	100	6.4	7.48	10.6	0.668	-136.6	0.19	36.7	
	1014	53.52	100	6.5	7.50	10.6	0.667	-135.6	0.19	37.2	
Post-Purge											

Remarks: Pump Intake Depth: 60 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 100 ml/min

NM = NOT MEASURED, SEE INITIAL PURGE LOG.

SAMPLING

Depth to Water Before Sampling: 53.52

Sample Methodology: ~~PERISTALTIC~~ Bladder Pump

Sample Name: EBP-MW13-R0319

QC Sample: —

Sample Date/Time: 3/25/2019 1015

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N (N circled) Filter Size: —

Sample Observations: —

Parameters: VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: EBP-MW17	Site: IAAAP EBP
Field Crew: Joshua Harris	Date: 3/25/19 Project #:

Well Depth (ft.): 51
DTW (ft.): 0.03
Water Column (ft.):
Well Diameter (in.):
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Bladder Pump Low Flow
WL# C103372
Water Quality Meter: Turbidimeter # C103314 YSI # C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1042

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1049	3.90	400	1	7.23	9.3	0.77	-119.4	0.37	578	Gray murky odor
	1112	14.73	100	2.6	7.25	9.3	0.77	-134.7	0.19	278	
	1115	14.90	100	2.7	7.25	9.3	0.77	-141.2	0.19	259	↓ rate
	1145	30.25	100	6	7.24	10.6	0.77	-145.8	0.18	70.0	↓ rate
	1148	30.46	100	6.1	7.27	10.2	0.77	-143.8	0.19	51.7	
	1151	30.50	100	6.2	7.24	10.5	0.77	-140.9	0.18	44.5	
	1154	30.52	100	6.3	7.22	10.9	0.77	-140.0	0.18	43.5	
	1157	30.52	100	6.4	7.22	10.9	0.77	-139.5	0.16	42.9	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

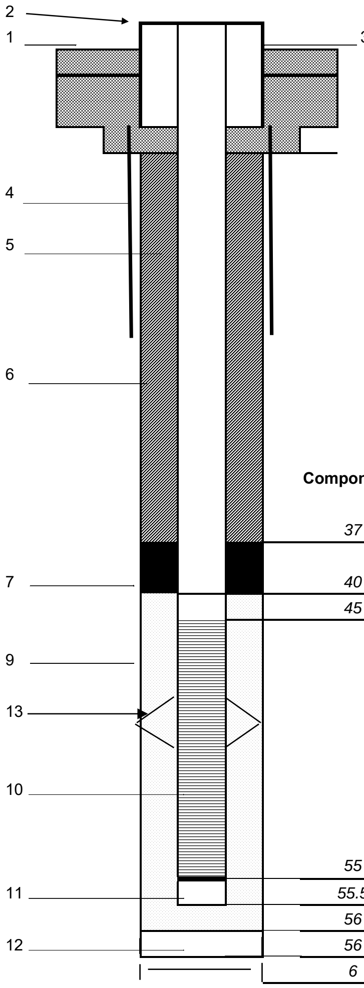
SAMPLING

Depth to Water Before Sampling: 30.52
Sample Methodology: Bladder pump
Sample Name: EBP-MW17-0319 QC Sample: —
Sample Date/Time: 3/25/19 1200
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations: —
Parameters: Explosives

ch2m	PROJECT NUMBER 679172CH	WELL NUMBER **EBP-MW7**
	WELL COMPLETION DIAGRAM	

PROJECT NAME : *IAAAP RI*
NORTHING: *301758.441* EASTING: *2277525.304*
START DATE: *08-18-2018* END DATE: *08-18-2018*
BOREHOLE DIAMETER: *6* inches
TOTAL BOREHOLE DEPTH: *56* feet bgs

LOCATION NAME: *East Burn Pad*
DRILLING CONTRACTOR: *Cascade*
DRILLING METHOD: *Rotosonic*
DRILLING EQUIPMENT: *Mini sonic*
LOGGED BY: *Lauren Martin*



Component Depths BGS

37	Top of transition seal (feet bgs)
40	Top of filter pack (feet bgs)
45	Top of screen (feet bgs)
55	Bottom of screen (feet bgs)
55.5	Bottom of sump (feet bgs)
56	Bottom of filter pack (feet bgs)
56	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*671.417*	feet msl
2- Top of casing elevation	*673.801*	feet msl
3- Surface completion type	*Steel protective casing*	
a) Protective casing dimensions	*NA*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	*-*	inches
b) Length	*-*	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*47*	feet (including stick-up)
6- Sanitary seal type	*Grout*	
a) Method of placement	*Gravity fed*	
b) Volume used	*50*	gallons
c) Calculated volume	*-* feet^3 -	gallons
7- Transition seal type	*Bentonite plug*	
a) Quantity used	*1*	50 lb bags
b) Calculated quantity	*-* feet^3 -	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	*-*	50 lb bags
b) Calculated quantity	*-* feet^3 -	50 lb bags
9- Filter pack type	*Filter Sil sand*	
a) Quantity used	*5*	50 lb bags
b) Calculated quantity	*-* feet^3 -	50 lb bags
10- Screen type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*Schedule 40 PVC end cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	*-*	
b) Calculated quantity	*-* feet^3	
13- Centralizer type	*NA*	
a) Depths	*44 and 54*	feet bgs

Well Development

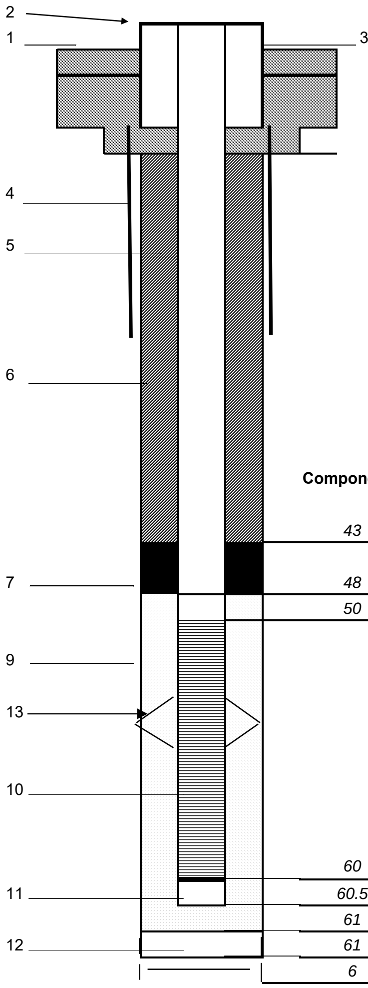
Start Date/Time:	*08-21-2018 / 11:10*	
End Date/Time:	*08-21-2018 / 12:04*	
Measured Depth to Water	*19.24*	feet btoc
Development Method:	*Surge block and pump*	
Duration:	*0.90*	hours
Purge volume:	*13.5*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*6.29*	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Well purged dry during development on 08-21-2018

ch2m	PROJECT NUMBER 679172CH	WELL NUMBER **EBP-MW9**
	WELL COMPLETION DIAGRAM	

PROJECT NAME :	*IAAAP RI*	LOCATION NAME:	*East Burn Pad*
NORTHING:	*301385.567* EASTING: *2277888.069*	DRILLING CONTRACTOR:	*Cascade*
START DATE:	*8/5/2018* END DATE: *8/5/2018*	DRILLING METHOD:	*Rotosonic*
BOREHOLE DIAMETER:	*6* inches	DRILLING EQUIPMENT:	*Minisonic*
TOTAL BOREHOLE DEPTH:	*61* feet bgs	LOGGED BY:	*M. Tekle*



Component Depths BGS

43	Top of transition seal (feet bgs)
48	Top of filter pack (feet bgs)
50	Top of screen (feet bgs)
60	Bottom of screen (feet bgs)
60.5	Bottom of sump (feet bgs)
61	Bottom of filter pack (feet bgs)
61	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*669.610*		feet msl
2- Top of casing elevation	*672.297*		feet msl
3- Surface completion type	*Steel protective casing*		
a) Protective casing dimensions	*NA*		
b) Concrete pad dimensions	*24 x 24*		inches
c) Bollards	*3*		
4- Conductor casing type	*None*		
a) Diameter	-		inches
b) Length	-		feet
5- Well casing type	*Schedule 40 PVC*		
a) Diameter	*2*		inches
b) Length	*52*		feet (including stick-up)
6- Sanitary seal type	*Bentonite cement mix*		
a) Method of placement	*Pump*		
b) Volume used	*40*		gallons
c) Calculated volume	-	$feet^3$ -	gallons
7- Transition seal type	*Bentonite chips (3/8")*		
a) Quantity used	*1*		50 lb bags
b) Calculated quantity	-	$feet^3$ -	50 lb bags
8- Transition filter pack type	*None*		
a) Quantity used	-		50 lb bags
b) Calculated quantity	-	$feet^3$ -	50 lb bags
9- Filter pack type	*Filter sand*		
a) Quantity used	*3.5*		50 lb bags
b) Calculated quantity	-	$feet^3$ -	50 lb bags
10- Screen type	*Schedule 40 PVC*		
a) Diameter	*2*		inches
b) Length	*10*		feet
c) Slot size	*0.010*		inches
11- Sump / end cap type	*Schedule 40 PVC end cap*		
a) Diameter	*2*		inches
b) Length	*0.5*		feet
12- Backfill type	*None*		
a) Quantity used	-		
b) Calculated quantity	-	$feet^3$	
13- Centralizer type	*NA*		
a) Depths	*48 and 60*		feet bgs

Well Development

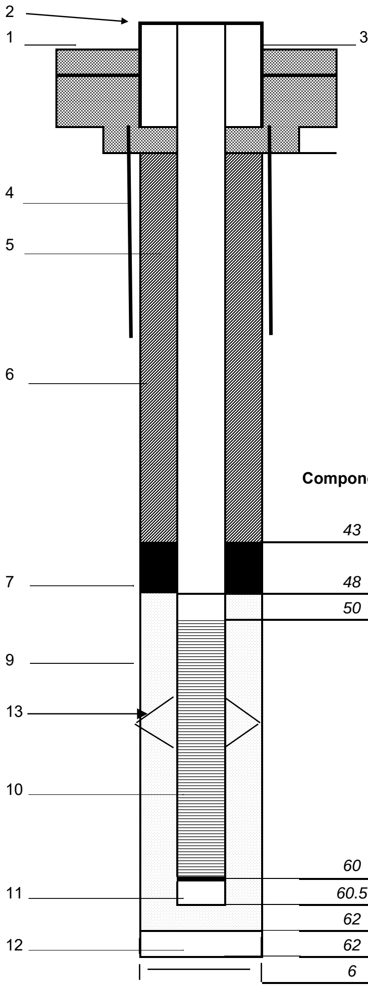
Start Date/Time:	*08-21-2018 / 10:37*	
End Date/Time:	*08-21-2018 / 10:53*	
Measured Depth to Water	*56.11*	feet btoc
Development Method:	*Surge block and pump*	
Duration:	*0.27*	hours
Purge volume:	*4*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*1.11*	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Well purged dry during development on 08-21-2018

ch2m	PROJECT NUMBER 679172CH	WELL NUMBER **EBP-MW13**
	WELL COMPLETION DIAGRAM	

PROJECT NAME :	*IAAAP RI*	LOCATION NAME:	*East Burn Pad*
NORTHING:	*301569.504* EASTING: *2277121.635*	DRILLING CONTRACTOR:	*Cascade*
START DATE:	*08-08-2018* END DATE: *08-08-2018*	DRILLING METHOD:	*Rotosonic*
BOREHOLE DIAMETER:	*6* inches	DRILLING EQUIPMENT:	*Minisonic*
TOTAL BOREHOLE DEPTH:	*62* feet bgs	LOGGED BY:	*Lauren Martin*



Component Depths BGS

43	Top of transition seal (feet bgs)
48	Top of filter pack (feet bgs)
50	Top of screen (feet bgs)
60	Bottom of screen (feet bgs)
60.5	Bottom of sump (feet bgs)
62	Bottom of filter pack (feet bgs)
62	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*664.388*	feet msl
2- Top of casing elevation	*666.929*	feet msl
3- Surface completion type	*Steel protective casing*	
a) Protective casing dimensions	*NA*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	*-*	inches
b) Length	*-*	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*52*	feet (including stick-up)
6- Sanitary seal type	*Grout*	
a) Method of placement	*Gravity fed*	
b) Volume used	*60*	gallons
c) Calculated volume	*-* feet^3 *-*	gallons
7- Transition seal type	*Bentonite plug*	
a) Quantity used	*1*	50 lb bags
b) Calculated quantity	*-* feet^3 *-*	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	*-*	50 lb bags
b) Calculated quantity	*-* feet^3 *-*	50 lb bags
9- Filter pack type	*Filter Sil sand*	
a) Quantity used	*4*	50 lb bags
b) Calculated quantity	*-* feet^3 *-*	50 lb bags
10- Screen type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*Schedule 40 PVC end cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	*-*	
b) Calculated quantity	*-* feet^3	
13- Centralizer type	*NA*	
a) Depths	*49 and 59*	feet bgs

Well Development

Start Date/Time:	*08-21-2018 / 14:30*	
End Date/Time:	*08-21-2018 / 15:45*	
Measured Depth to Water	*23.58*	feet btoc
Development Method:	*Surge block and pump*	
Duration:	*1.25*	hours
Purge volume:	*14.5*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*6.14*	gallons

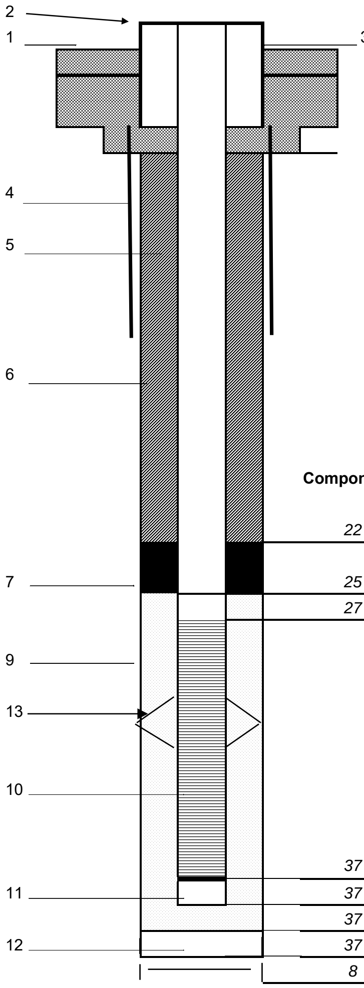
Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Well purged dry during development on 08-21-2018

PROJECT NUMBER	WELL NUMBER
679172CH	EBP-MW15

WELL COMPLETION DIAGRAM

PROJECT NAME :	*IAAAP RI*	LOCATION NAME:	*East Burn Pad*
NORTHING:	*302295.669* EASTING: *2277531.506*	DRILLING CONTRACTOR:	*Dakota*
START DATE:	*07-11-2018* END DATE: *07-11-2018*	DRILLING METHOD:	*Hollow stem auger*
BOREHOLE DIAMETER:	*8* inches	DRILLING EQUIPMENT:	*Geoprobe 6620DT*
TOTAL BOREHOLE DEPTH:	*37* feet bgs	LOGGED BY:	*Lauren Martin*



Component Depths BGS

22	Top of transition seal (feet bgs)
25	Top of filter pack (feet bgs)
27	Top of screen (feet bgs)
37	Bottom of screen (feet bgs)
37	Bottom of sump (feet bgs)
37	Bottom of filter pack (feet bgs)
37	Bottom of borehole (feet bgs)
8	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*685.012*	feet msl
2- Top of casing elevation	*687.909*	feet msl
3- Surface completion type	*Steel protective casing*	
a) Protective casing dimensions	*NA*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	-	inches
b) Length	-	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*29*	feet (including stick-up)
6- Sanitary seal type	*Grout*	
a) Method of placement	*Gravity fed*	
b) Volume used	*44*	gallons
c) Calculated volume	- feet^3 -	gallons
7- Transition seal type	*Bentonite plug*	
a) Quantity used	*1.5*	50 lb bags
b) Calculated quantity	- feet^3 -	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	-	50 lb bags
b) Calculated quantity	- feet^3 -	50 lb bags
9- Filter pack type	*Premium silica sand*	
a) Quantity used	*7.5*	50 lb bags
b) Calculated quantity	- feet^3 -	50 lb bags
10- Screen type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*Schedule 40 PVC end cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	-	
b) Calculated quantity	- feet^3	
13- Centralizer type	*None*	
a) Depths	-	feet bgs

Well Development

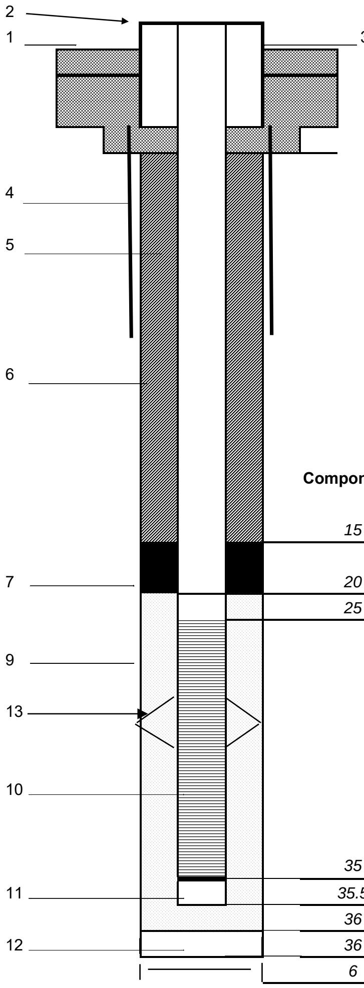
Start Date/Time:	*08-05-2018 / 10:28*	
End Date/Time:	*08-05-2018 / 11:27*	
Measured Depth to Water	*17.5*	feet btoc
Development Method:	*Bailer*	
Duration:	*1*	hour
Purge volume:	*16.5*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*3.67*	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Well bailed dry during development on 08-05-2018

ch2m	PROJECT NUMBER 679172CH	WELL NUMBER **EBP-MW16**
	WELL COMPLETION DIAGRAM	

PROJECT NAME :	*IAAAP RI*			LOCATION NAME:	*East Burn Pad*
NORTHING:	*301962.704*	EASTING:	*2277104.091*	DRILLING CONTRACTOR:	*Cascade*
START DATE:	*08-16-2018*	END DATE:	*08-16-2018*	DRILLING METHOD:	*Rotosonic*
BOREHOLE DIAMETER:	*6* inches			DRILLING EQUIPMENT:	*Minisonic*
TOTAL BOREHOLE DEPTH:	*36* feet bgs			LOGGED BY:	*Lauren Martin*



Component Depths BGS

15	Top of transition seal (feet bgs)
20	Top of filter pack (feet bgs)
25	Top of screen (feet bgs)
35	Bottom of screen (feet bgs)
35.5	Bottom of sump (feet bgs)
36	Bottom of filter pack (feet bgs)
36	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*665.253*		feet msl
2- Top of casing elevation	*667.729*		feet msl
3- Surface completion type	*Steel protective casing*		
a) Protective casing dimensions	*NA*		
b) Concrete pad dimensions	*24 x 24*		inches
c) Bollards	*3*		
4- Conductor casing type	*None*		
a) Diameter	*-*		inches
b) Length	*-*		feet
5- Well casing type	*Schedule 40 PVC*		
a) Diameter	*2*		inches
b) Length	*27*		feet (including stick-up)
6- Sanitary seal type	*Quick grout*		
a) Method of placement	*-*		
b) Volume used	*20*		gallons
c) Calculated volume	*-*	feet^3 -	gallons
7- Transition seal type	*Bentonite plug*		
a) Quantity used	*1*		50 lb bags
b) Calculated quantity	*-*	feet^3 -	50 lb bags
8- Transition filter pack type	*None*		
a) Quantity used	*-*		50 lb bags
b) Calculated quantity	*-*	feet^3 -	50 lb bags
9- Filter pack type	*Filter Sil sand*		
a) Quantity used	*10*		50 lb bags
b) Calculated quantity	*-*	feet^3 -	50 lb bags
10- Screen type	*Schedule 40 PVC*		
a) Diameter	*2*		inches
b) Length	*10*		feet
c) Slot size	*0.010*		inches
11- Sump / end cap type	*Schedule 40 PVC end cap*		
a) Diameter	*2*		inches
b) Length	*0.5*		feet
12- Backfill type	*None*		
a) Quantity used	*-*		
b) Calculated quantity	*-*	feet^3	
13- Centralizer type	*NA*		
a) Depths	*24 and 34*		feet bgs

Well Development

Start Date/Time:	*08-21-2018 / 13:26*	
End Date/Time:	*08-21-2018 / 13:42*	
Measured Depth to Water	*27.70*	feet btoc
Development Method:	*Surge block and pump*	
Duration:	*0.27*	hours
Purge volume:	*4*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*1.52*	gallons

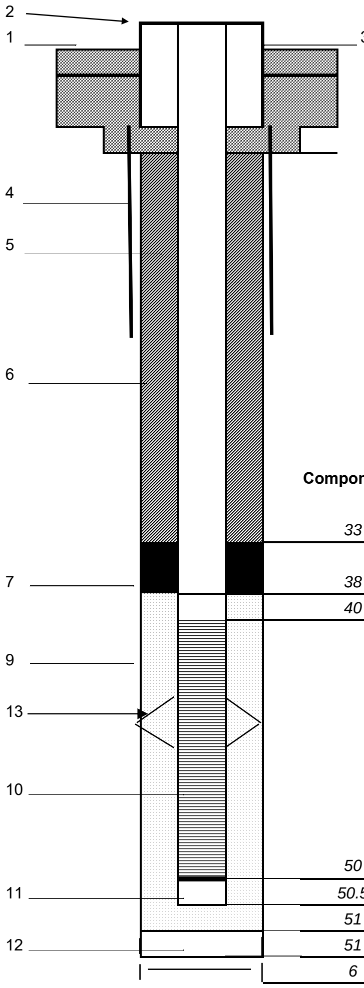
Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Well purged dry during development on 08-21-2018

PROJECT NUMBER	WELL NUMBER
679172CH	**EBP-MW17**

WELL COMPLETION DIAGRAM

PROJECT NAME :	*IAAAP RI*	LOCATION NAME:	*East Burn Pad*
NORTHING:	*301212.629* EASTING: *2277119.48*	DRILLING CONTRACTOR:	*Cascade*
START DATE:	*08-05-2018* END DATE: *08-05-2018*	DRILLING METHOD:	*Rotosonic*
BOREHOLE DIAMETER:	*6* inches	DRILLING EQUIPMENT:	*Minisonic*
TOTAL BOREHOLE DEPTH:	*51* feet bgs	LOGGED BY:	*Micheal Tekle*



Component Depths BGS

Depth	Component
33	Top of transition seal (feet bgs)
38	Top of filter pack (feet bgs)
40	Top of screen (feet bgs)
50	Bottom of screen (feet bgs)
50.5	Bottom of sump (feet bgs)
51	Bottom of filter pack (feet bgs)
51	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

Item	Value	Units
1- Ground elevation at well	*637.453*	feet msl
2- Top of casing elevation	*640.179*	feet msl
3- Surface completion type	*Steel protective casing*	
a) Protective casing dimensions	*NA*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	-	inches
b) Length	-	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*42.5*	feet (including stick-up)
6- Sanitary seal type	*Bentonite grout mix*	
a) Method of placement	*Pump*	
b) Volume used	*40*	gallons
c) Calculated volume	- feet^3 -	gallons
7- Transition seal type	*Bentonite chips (3/8")*	
a) Quantity used	*1*	50 lb bags
b) Calculated quantity	- feet^3 -	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	-	50 lb bags
b) Calculated quantity	- feet^3 -	50 lb bags
9- Filter pack type	*Filter sand*	
a) Quantity used	*3.5*	50 lb bags
b) Calculated quantity	- feet^3 -	50 lb bags
10- Screen type	*V-wire*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*End cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	-	
b) Calculated quantity	- feet^3	
13- Centralizer type	*None*	
a) Depths	-	feet bgs

Well Development

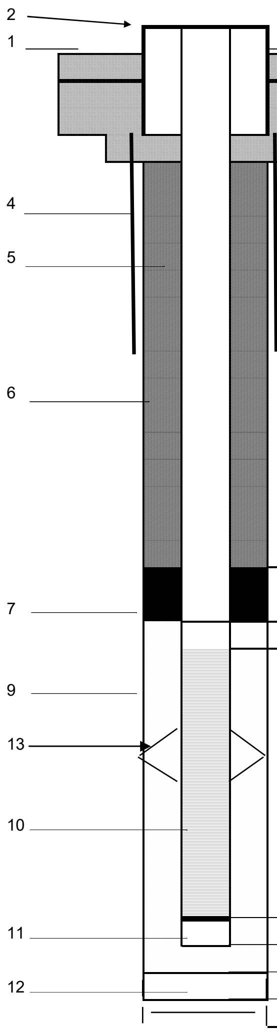
Start Date/Time:	*08-21-2018 / 08:40*	
End Date/Time:	*08-21-2018 / 10:11*	
Measured Depth to Water	*0.10*	feet btoc
Development Method:	*Pump*	
Duration:	*1.5*	hours
Purge volume:	*11*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*8.47*	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Well purged dry during development on 08-21-2018

ch2m	PROJECT NUMBER: 679172CH	WELL NUMBER: **JAW-06R**
	WELL COMPLETION DIAGRAM	

PROJECT NAME :	*IAAAP RI*	LOCATION NAME:	*East Burn Pad*
NORTHING:	*302378.415* EASTING: *2276810.214*	DRILLING CONTRACTOR:	*Roberts*
START DATE:	*05-12-2020* END DATE: *05-12-2020*	DRILLING METHOD:	*Hollow Stem Auger*
BOREHOLE DIAMETER:	*6* inches	DRILLING EQUIPMENT:	*Geoprobe 8040DT*
TOTAL BOREHOLE DEPTH:	*28* feet bgs	LOGGED BY:	*Dave Kortjohn (BOS)*



Component Depths BGS

13	Top of transition seal (feet bgs)
15.5	Top of filter pack (feet bgs)
17.5	Top of screen (feet bgs)
27.5	Bottom of screen (feet bgs)
28	Bottom of sump (feet bgs)
28	Bottom of filter pack (feet bgs)
28	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*676.650*	feet msl
2- Top of casing elevation	*679.030*	feet msl
3- Surface completion type	*Steel protective casing*	
a) Protective casing dimensions	*4 feet long / 4 inches wide*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	*-*	inches
b) Length	*-*	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*21*	feet (including stick-up)
6- Sanitary seal type	*Bentonite quick grout*	
a) Method of placement	*Gravity fed*	
b) Volume used	*30*	gallons
c) Calculated volume	*-* feet^3 *-*	gallons
7- Transition seal type	*Hydrated medium bentonite chips*	
a) Quantity used	*1*	50 lb bags
b) Calculated quantity	*0.5* feet^3	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	*-*	50 lb bags
b) Calculated quantity	*-* feet^3 *-*	50 lb bags
9- Filter pack type	*FiterSil industrial quartz sand*	
a) Quantity used	*6*	50 lb bags
b) Calculated quantity	*-* feet^3 *-*	50 lb bags
10- Screen type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*Schedule 40 PVC end cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	*-*	
b) Calculated quantity	*-* feet^3	
13- Centralizer type	*None*	
a) Depths	*-*	feet bgs

Well Development

Start Date/Time:	*06-04-2020 / 15:27*	
End Date/Time:	*06-04-2020 / 16:06*	
Measured Depth to Water	*12.76*	feet btoc
Development Method:	*Submersible pump*	
Duration:	*0.65*	hours
Purge volume:	*12*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*2.86*	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Purged dry during well development on 06-04-2020

ch2m

PROJECT NUMBER	WELL NUMBER	
679172	EBP-MW7	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT : IAAAP
LOCATION : EBP
DEVELOPMENT CONTRACTOR : Cascade
LOGGER : L. Martin
DEVELOPMENT METHOD AND EQUIPMENT USED : Pump and tank
START : 1110 8-21-18
END : 1204 8-21-18

START WATER LEVELS : 19.24' btoc
WELL DEPTH: 57.85' btoc
WELL VOLUME: 6.29 gallons
MAXIMUM DRAWDOWN DURING DEVELOPMENT:
TOTAL QUANTITY OF WATER DISCHARGED:
DISPOSITION OF DISCHARGE WATER:

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1120	Begin surging						
1126	Begin surging and purging						water is turbid
1128	Purging only						water clears up.
1129	Surge again while pumping						water is cloudy.
1131		49.20'	—	—	—	—	pump is 1.5' off bottom
1135	10	Dry	—	—	—	—	Stop pump
1139	10	53.43'	—	—	—	—	Start pump; pump is at bottom of well.
1142	12	Dry	—	—	—	—	Stop pump.
1152		55.0'	—	—	—	—	
1154		54.78'	—	—	—	—	
1155			—	—	—	—	Begin purging very turbid
1158	13	Dry	—	—	—	—	~~Stop pump~~ then recharges
1201	13.5	Dry	—	—	—	—	Stop pump pull pump

ch2m

PROJECT NUMBER	WELL NUMBER	SHEET 1 OF 1
679172	EBP-MW9	

WELL DEVELOPMENT LOG

PROJECT: IAAAP
LOCATION: EBP
LOGGER: L. Martin
DEVELOPMENT CONTRACTOR: Cascade
DEVELOPMENT METHOD AND EQUIPMENT USED: Pump and tank.
START: 1037 8-21-18
END: 1053 8-21-18

START WATER LEVELS: 56.11' btoc
WELL DEPTH: 62.92' btoc
WELL VOLUME:
MAXIMUM DRAWDOWN DURING DEVELOPMENT: Dry
TOTAL QUANTITY OF WATER DISCHARGED: 4 gallons
DISPOSITION OF DISCHARGE WATER: turbid to cloudy

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
~~1037~~ 1043		Begin purge					
1047		60.49	—	—	—	—	water is turbid
1053	4	Dry	—	—	—	—	water is turbid

Note: on 8-18-18 drillers surged and purged well; no static WL was collected prior to purging.

ch2m

PROJECT NUMBER	WELL NUMBER	
479172	EBP-MW13	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT : IAAAP
LOCATION : EBP-
DEVELOPMENT CONTRACTOR : Cascade
LOGGER : L. Martin
DEVELOPMENT METHOD AND EQUIPMENT USED : Pump & tank
START : 1430 8-21-18
END : 1545 8-21-18

START WATER LEVELS : 23.58' btoc
WELL DEPTH: 61.23' btoc
WELL VOLUME: 6.14 gallons
MAXIMUM DRAWDOWN DURING DEVELOPMENT: Dry
TOTAL QUANTITY OF WATER DISCHARGED: 14.5 gallons
DISPOSITION OF DISCHARGE WATER: turbid

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1445	0	23.58'	—	—	—	—	begin purge; water is turbid
1449		47.0'	—	—	—	—	turbid.
1457	12	Dry	—	—	—	—	Stop pump.
1500	12	59.00'	—	—	—	—	pump off
1511	12	58.35'	—	—	—	—	turn pump on
1513	14	Dry	—	—	—	—	Stop pumping
1523	14	59.40'	—	—	—	—	
1538	14	59.05'	—	—	—	—	Begin pumping
1539	14.5	Dry	—	—	—	—	Stop pumping

ch2m

PROJECT NUMBER	WELL NUMBER	
679172	EBP-MW15	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: IAAP
LOCATION: EBP 1028 sun
LOGGER: Z. Dolbear
DEVELOPMENT CONTRACTOR: Dakota
DEVELOPMENT METHOD AND EQUIPMENT USED: bailer ~~[illegible]~~
START: 8/5/18 1028
END: 8/5/18 1127

START WATER LEVELS: 17.5'
WELL DEPTH: 40.00
WELL VOLUME: 3.67 x 5 = 18.34
MAXIMUM DRAWDOWN DURING DEVELOPMENT: Dry
TOTAL QUANTITY OF WATER DISCHARGED: 16.5 gallons
DISPOSITION OF DISCHARGE WATER: FDA

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1040	2	24.70	over	13.9	7.95	.546	~~[illegible]~~ / cloudy
1044	4	29.05	over	12.7	7.67	0.557	"
1051	5.5	30.51	over	13.5	7.74	0.624	"
1055	7.0	32.20	over	13.1	7.61	0.578	"
1105	11.0	34.88	over	14.2	7.47	0.549	"
1118	15.0	38.3	over	13.5	7.45	0.582	"
1127	16.5	DRY	over	–	–	–	–
1130	–	38.05					
1135	–	37.30					
1140	–	36.40					
1145	–	35.88					
1150	–	35.14					
1155	–	34.65					
1200	–						

8/5/18

ch2m

PROJECT NUMBER	WELL NUMBER	
679172	EBP-MW16	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: IAAAP
LOCATION: EBP
DEVELOPMENT CONTRACTOR: Cascade
LOGGER: L. Martin
DEVELOPMENT METHOD AND EQUIPMENT USED: Pump & tank
START: 1300 8-21-18
END:

START WATER LEVELS: 27.70' btoc
WELL DEPTH: 37.00' btoc
WELL VOLUME: 1.52 gallons
MAXIMUM DRAWDOWN DURING DEVELOPMENT: Dry
TOTAL QUANTITY OF WATER DISCHARGED: 4
DISPOSITION OF DISCHARGE WATER: turbid

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1326		Begin surging					
1336							Start pump
1342	3	Dry					Stop pump.
1400	3	34.50'	—	—	—	—	Start purging.
1402	4	Dry	—	—	—	—	Stop purging
1424	4	WL still below top of pump					pull pump.
1535		35.58'	—	—	—	—	

ch2m.

PROJECT NUMBER	WELL NUMBER	SHEET 1 OF 1
679172	EBP-MW17	

WELL DEVELOPMENT LOG

PROJECT : I AAAP LOCATION : EBP
DEVELOPMENT CONTRACTOR : Cascade LOGGER : L. Martin
DEVELOPMENT METHOD AND EQUIPMENT USED : Pump, tank
START : 0840
END : 1011 8-21-18

START WATER LEVELS : 0.1' btoc
WELL DEPTH: 52.05' btoc
WELL VOLUME: 8.47 gal
MAXIMUM DRAWDOWN DURING DEVELOPMENT: Dry
TOTAL QUANTITY OF WATER DISCHARGED:
DISPOSITION OF DISCHARGE WATER: turbid

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
0910	—	48.0'	—	—	—	—	cloudy
0918	Stop pump to place tank in bed of truck.						
0925	Begin purge again						
0928	well goes dry.						
0948		47.5'	—	—	—	—	turbid; begin purge
0951	10	dry.	—	—	—	—	turbid, shut off pump
1008	10	48.5'	—	—	—	—	begin purge
1011	.11	Dry	—	—	—	—	Stop pump.

ch2m

PROJECT NUMBER	WELL NUMBER JAW-06R	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: IAAAP
LOCATION: East Burn Pad
DEVELOPMENT CONTRACTOR: CH2M/Jacobs
LOGGER: Dave Kortjohn
DEVELOPMENT METHOD AND EQUIPMENT USED:
START: 1527 6/4/20
END: 1606 6/4/20
START WATER LEVELS: 12.76
WELL DEPTH: 30.30
WELL VOLUME:
MAXIMUM DRAWDOWN DURING DEVELOPMENT:
TOTAL QUANTITY OF WATER DISCHARGED: 12 gal.
DISPOSITION OF DISCHARGE WATER:

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1527		12.76	40.6	11.7	7.29	2.20	clear/slightly cloudy
1532		19.20	20.9	12.8	7.20	2.14	↓
1537		20.45	12.1	13.3	7.18	2.11	clear
1542		21.48	9.58	11.8	7.16	1.98	
1547		22.80	14.1	10.8	7.18	2.12	↓
1552		25.48	26.1	11.2	7.17	2.21	slightly cloudy
1557		26.79	4.04	11.4	7.18	2.26	clear
1602		28.15	7.85	11.3	7.19	2.29	↓
1606	12 gal.	Dry					

Multigas readings
0% LEL CH_4
20.8% O_2
0 ppm CO
0.0 ppm H_2S

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID WBP-MW4

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** WBP
Weather: NA **Drilling Contractor:** Dakota
Drilling Method and Equipment Used: Geoprobe 6620 DT
Water Level: **Start Date & Time:** 7/11/2018 at 15:15 **End Date & Time:** 7/11/18 at 15:30 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
0-5	0-5	4.5	DP1	CL	0 - 4.5' - **CL**: lean clay, trace gravel and sand, brown, (7.5YR 4/4), dry, very stiff 4.5 - 5' - No recovery	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
5-10	5-10	5.0	DP2	CL	5 - 10' - **CL**: lean clay, trace sand and gravel, gray, (10YR 5/1), and dark yellowish brown, (10YR 4/4), mottled black and orange, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
10-15	10-15	2.5	DP3		10 - 12.5' - CL: sandy clay, trace gravel, white, (10YR 8/1) and gray, (10YR 6/1), mottled black and orange, moist, stiff End of boring at 12.5' bgs	- 0.0 ppm - 0.0 ppm Driller: refusal at 12.5' bgs
15-20						
20-25						
25-30						

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID WBP-MW5

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** West Burn Pad
Weather: low 50s, cloudy **Drilling Contractor:** Roberts
Drilling Method and Equipment Used: 6" hollow stem auger with split spoon soil sampling/Geoprobe 8040 DT
Water Level: N/A **Start Date & Time:** 5/11/2020 at 13:55 **End Date & Time:** 5/11/2020 at 14:30 **Logged By:** Dave Kortjohn

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	HA	1	SM	0 - 1' - **CL:** Topsoil, silt and fine sand, black, moist, some organics	0.0 ppm
				ML	1 - 3' - **ML:** Silt, dark brown, loose, little fine sand, little lean clay	0.0 ppm
5				CL	3 - 5' - **CL:** Lean clay, dark brown, moist, soft, little medium sand	0 - 5' - Advanced with hand auger and then resampled with HSA drilling method
	5-5.5	N/A	N/A	N/A	5.5' - Refusal (Bedrock, Limestone)	
10					End of boring at 5.5' - Refusal	
15						
20						
25						
30						

ch2m:

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID WBP-MW6

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** WBP

Weather: NA **Drilling Contractor:** Cascade

Drilling Method and Equipment Used: Mini Sonic 6" Rods

Water Level: Dry **Start Date & Time:** 7/19/18 at 14:05 **End Date & Time:** 7/19/18 at 14:40 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	5.0	S1	CL	0 - 1.5' - **CL**: lean clay, topsoil, very dark gray, (2.5Y 3/1), dry, stiff, trace organics	- 0.0 ppm
				CL	1.5 - 5' - **CL**: lean clay, trace gravel and sand, olive brown, (2.5Y 4/3), black and orange mottling, moist, very stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
5	5-10	3.5	S2	CL	5 - 8.5' - **CL**: lean clay, trace gravel and sand, dark yellowish brown, (10YR 4/4), moist, very stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm In borehole at 8.5' bgs: O2 - 20.9% VOCs - 504 CO - 173 ppm LEL - 4% H2S - 0.7 ppm Set casing at 8.5' bgs
					End of boring at 8.5' bgs - stopped on bedrock (in foot) See rock core log for bedrock drilling details.	
10						
15						
20						
25						
30						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID WBP-MW6	Sheet 2 of 3
	BORING LOG		

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** West Burn Pads
Weather: NA **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic 6" Rods
Water Level: N/A **Start Date & Time:** 7/24/2018 at 10:53 **End Date & Time:** 7/24/2018 at 16:06 **Logged By:** L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
11	R1 9-11.5 53%	40% Poor	10+	9.3' - F, 0 degrees, R, Planar 9.8' - Mechanical Breaks (MB) 10 - 10.3' - Fracture zone (FZ), 0 degrees, discoloration in fractures	9 - 10.3' - Limestone, fine to medium grained, very light gray (N8) and medium gray (N5), medium strong, no apparent bedding, shales/clay are washed out. Moderately to highly weathered	R1: 10:53 - 11:00 45 gallons used; 90% return
16.5	R2 11.5- 16.5 73%	20% Very Poor	10+ 4 3 2 NR	11.6', 11.3 - 11.4', 11.7 - 11.8', 12', 12.3', 12.4', 12.5', 12.9', 13.1', 13.4', 14.0', 14.2' - Fractures or Fracture Zone, 0 degrees, R & P, some clay, mostly washed out	11.5 - 15.2' - Limestone, very light gray (N8) and medium gray (N5), medium strong, lamina (shale beds to thin bedding), medium grained, slightly to moderately weathered, discolored in areas 15.2 - 16.5' - No Recovery	R2: 11:00 - 11:30 105 gallons used; 95% return
21.5	R3 16.5- 21.5 78%	50% Poor	10+ 10+ 4 4 NR	Discontinuities along shale beds, significantly washed out, discolored at top of core 17.2' - F, 0 degrees, R & U 17.8' - F, 30 degrees, R & U 18.5' - F, 0 degrees, R & U 18.7' - F, 10 degrees, R & U 19.4', 19.9' - F, 0 degrees, R & U	16.5 - 16.8', 17.6 - 18', 18.8 - 19.1' - Shale, decomposed, medium-dark gray (N4), highly weathered 16.8-17.6', 18-18.8', 19.1-20.4' - Limestone as 11.5-15.2'	R3: 11:40 - 11:46 & 13:15 - 13:27 100 gallons used; 100% return
26.5	R4 21.5- 26.5 100%	82% Good	3 2 2 2	21.9' - F, 0 degrees, S & P 22.9' - F, 5 degrees, R & U 23.2 - 23.25' - FZ, 0 degrees, R & U 23.4' - F, 0 degrees, R & U tightly healed 23.8' - F, 0 degrees, R & U 24.4 - 24.6' - Shale, decomposed 25.2' - F, 0 degrees, R & U 25.4' - F, 0 degrees, R & U 25.8' - F, 0 degrees, R & U 26.2' - F, 0 degrees, R & U	21.5 - 26.5' - Same as 16.8 - 17.6' Shale at 16.5 - 16.8 and 24.2 - 24.5'	R4: 13:56 - 14:19 150 gallons used; 100% return
31.5	R5 26.5- 31.5 100%	88% Good	1 1 0 1 1	27.2' - F, 0 degrees, R & U 27.9' - F, 0 degrees, R & U 29' - F, 0 degrees, R & U 30.05' - F, 0 degrees, R & U 30.7' - F, 0 degrees, R & U 31.1' - F, 0 degrees, R & U	26.5 - 31.5' - Same as 21.5 -26.5'	R5: 14:50 - 15:10 105 gallons used; 100% return
36.5	R6 31.5- 36.5 65"/60"	65% Fair	10+ 0 10+ 0 0	31.7', 31.8', 32.5 - 32.7', 33.5 - 34.6' - F or FZ, 0 degrees, R & U, in shale 34' - F, 0 degrees, R & U Other breaks are MB	31.5 - 31.8', 32.4 - 32.7', 33.5 - 34.6' - Shale as 16.5 - 16.8' 31.8 - 32.4', 32.7 - 33.5', 34.6 - 36.5' - Limestone as 21.5 - 26.5' 29 - 31.5' - evidence of secondary porosity - staining in pores	R6: 15:10 - 15:34 85 gallons used; 100% return Driller: Fast drilling & color change at 33 - 33.5' bgs

ch2m:	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **WBP-MW6**	Sheet 3 of 3

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** West Burn Pads
Weather: NA **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic 6" Rods
Water Level: N/A **Start Date & Time:** 7/24/2018 at 10:53 **End Date & Time:** 7/24/2018 at 16:06 **Logged By:** L. Martin

Feet BGS	Core Run Length and Recovery (%)	Discontinuous: RQD (%)	Discontinuous: Fractures per Foot	Discontinuous: Core Description — Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology — Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments — Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R7 36.5- 41.5 92%	58% Fair	5 1 2 3 0	36.6', 36.8', 37.1', 37.2', 37.3' - F, 0 degrees, R & U	36.5 - 41.5' - interbedded limestone and shale, medium strong to strong LS Ls - very light gray (N8) and light gray (N7), medium strong to strong, medium grained, sound to slightly fractured, thin to medium medding, slightly weathered to unweathered. Trace discoloration in pores. Sh - dark gray (N8), extremely weak to weak rock, extremely to slightly fractured, fresh to disintegrated, laminated to very thin beds	R7: 15:47 - 16:06 95 gallons used; 100% return
41.5	R8 41.5- 46.5 65"/60"	52% Fair	3 5 1 1 1	41.8', 42', 42.3', 42.6', 42.8', 42.95' 43.2', 43.3', 44.3', 44.8', 46.4' - F, 0 degrees, R & U	41.5 - 46.5' - Same as above	R8: 16:16 - 16:34 105 gallons used; 100% return
46.5					End of Boring at 46.5' bgs	
51.5						
56.5						
61.5						
66.5						

ch2m

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID WBP-MW7

Sheet 1 of 1

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** WBP

Weather: NA **Drilling Contractor:** Dakota

Drilling Method and Equipment Used: Geoprobe 6620 DT

Water Level: Dry **Start Date & Time:** 7/11/18 at 14:37 **End Date & Time:** 7/11/18 at 14:45 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	4.1	DP1	CL	0 - 4.1' - **CL**: lean clay, trace gravel and sand, very dark brown, (10YR 2.2), moist to dry, soft	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
5					4.1 - 5' - No recovery	- 0.0 ppm
	5-10	1.4	DP2	CL	5 - 5.9' - **CL**: lean clay, trace gravel and sand, very dark brown, (10YR 2.2), moist to dry, soft	- 0.0 ppm Driller: refusal at 6.4' bgs
					5.9 - 6.4' - weathered bedrock, white, (10YR 8/1), dry loose gravel chips with sand and silt from drilling processes	- 0.0 ppm Creek is moist but not flowing
					End of boring at 6.4' bgs	
10						
15						
20						
25						
30						

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID WBP-MW8

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** WBP
Weather: NA **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic 6" Rods
Water Level: Dry **Start Date & Time:** 7/19/18 at 16:00 **End Date & Time:** 7/19/18 at 16:17 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
0-5	0-5	5.0	S1	CL	0 - 1' - **CL**: lean clay, topsoil, very dark gray, (2.5Y 3/1), dry, stiff, trace organics	Getting readings on soil from bag. All background - 0.0 ppm
				CL	1 - 5' - **CL**: lean clay, dark yellowish brown (10YR 4/4), moist, very stiff, trace gravel and sand	- 0.0 ppm - 0.0 ppm In borehole at 0-5' bgs: O2 - 20.9% CO - 0 ppm H2S - 0 ppm LEL - 0% VOCs - 0.1
5-10	5-10	5.0	S2	CL	5 - 10' - Same as above	- 0.0 ppm - 0.0 ppm - 0.0 ppm In borehole at 5-10' bgs O2 - 20.9% CO - 0 ppm H2S - 0 ppm LEL - 0% VOCs - 0
10-15	10-15	2.0	S3	CL	10 - 12' - Same as above. Weathered bedrock in foot of barrel	- 0.0 ppm - 0.0 ppm
					End of boring at 12' bgs	- 0.0 ppm Set surface casing at 12' bgs DR used water
					See rock core log for bedrock drilling details.	
15-20						
20-25						
25-30						

ch2m:

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork | **Site Location:** West Burn Pads
Weather: NA | **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic HQ Wireline
Water Level: N/A | **Start Date & Time:** 7/25/2018 at 13:49 | **End Date & Time:** 7/26/2018 at 11:40 | **Logged By:** L. Martin & M. Tekle

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
17	R1 12.5-17 50%	75% Fair	10+ 10+ 10+ NR NR	Dark yellowish orange staining on fracture zones. Fracture zones associated with shale (decomposed and washed out)	12.5 - 17' - Limestone, very light gray (N8), medium grained, extremely fractured to slightly fractured, laminated to thin bedding, slightly weathered to completely weathered (washed out shale), extremely weak to medium strong. Shale is decomposed and washed out. Limestone is porous where not disintegrated.	R1: 13:49 - 14:08 10 gallons used; 100% return
20.3	R2 11.5-16.5 73%	20% Very Poor	0 10+ 10+	Fracture zones 18.2 - 20.85' washed out Discolored rock faces.	17 - 18.2' - Sound limestone, as above. 18.2 - 20.3' - Same as 12.5 - 17', not sound	R2: 14:12 - 14:39 120 gallons used; 90% return DR: only drilled 3'4"
22	R3 20.3-22 100%	95% Excellent	1 1	20.4' - F, 0 degrees, S & P 21.4' - F, 20 degrees, R & U	20.3 - 20.6' - Shale, dark gray (N3), laminated, moderately weathered, extremely weak 20.6 - 22' - Limestone, light gray (N7), fine to medium grained, sound ,unweathered, medium strong. Trace discoloration in pore space. Trace to little visible pore space (less than 1 mm wide each)	R3: 14:46 - 14:58 60 gallons used; 100% return DR: only drilled 20.3 - 22' bgs
27	R4 22-27 95%	68% Fair	3 1 4 1	22.4 - 22.6' - F, 60 degrees, R & U 23.5 - F, 0 degrees, S & P 24.4 - F, 0 degrees, R & U 24.7', 24.8', 24.9', 25.2', 26.1', 26.3' - F, 0 degrees, R & U	22 - 22.8', 23-26', 26.2 - 27' - Limestone as 17 - 18.2' 22.8 - 23', 26 - 26.2' - Shale as 20.3 - 20.6'	R4: 15:37 - 16:09 125 gallons used; 90% return
32	R5 27-32 94%	80% Good	1 2 2 1 2	27.3' - F, 0 degrees, P, R, no staining, closely spaced 28.2' - F, 0 degrees, P, R, yellowish orange staining, closely spaced28.5' - F, 0 degrees, P, R, yellowish orange staining, closely spaced 29.4' - F, 0 degrees, P, R 29.8' - F, ~15 degrees, U, R 30.2' - F, 0 degrees, P, S 30.9' - F, 0 degrees, P, R 31.5' - F, 0 degrees, P, S	27 - 32' - Limestone, light gray (N7), fine to medium grained, lamination, medium strong, slightly weathered	R5: 10:15 - 10:30 85 gallons used; 95% return
37	R6 32-37 95%	65% Fair	1 10+ 2 3 2	32.65' - F, 0 degrees, P, R 33.5' - F, 0 degrees, P, R 33.65' - F, 0 degrees, P, R 33.8' - F, 0 degrees, P, R 33.8 - 34.4' - Fracture zone, moderately weathered 35' - F, 0 degrees, P, Slickensided 35.2 - 35.5' - Fracture Zone 36.3' - F, 0 degrees, P, R 36.7' - F, 0 degrees, P, R	32 - 35.9' - Limestone with shale, medium dark gray (N4) to light gray (N7), very fine to medium grained, lamination, slightly weathered, medium strong 35.9 - 37' - Shale, medium dark gray (N4) to medium gray (N5), very few lamination, slightly weathered, medium strong, very fine grained	R6: 10:35 - 11:10 115 gallons used; 90 gallons return until 35.5' bgs and no return from 35.5 - 37' bgs

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID WBP-MW8	Sheet 3 of 3

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** West Burn Pads
Weather: NA **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic HQ Wireline
Water Level: N/A **Start Date & Time:** 7/25/2018 at 13:49 **End Date & Time:** 7/26/2018 at 11:40 **Logged By:** L. Martin & M. Tekle

Feet BGS	Core Run Length and Recovery (%)	Discontinuous			Lithology	Comments
		RQD (%)	Fractures per Foot	Core Description Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
42	R7 37-42 100%	100% Excellent	1 0 1 0 1	37.6' - F, 0 degrees, P, Slickensided 40' - F, 0 degrees, P, Slickensided 41.3' - F, 0 degrees, P, S	37 - 40.5' - Same As Above 40.5 - 41' - Shale with limestone, medium dark (N4), lamination, slightly weathered, medium strong 41 - 42' - Limestone, medium light gray (N6), very fine grained, slightly weathered, medium strong	R7: 11:16 - 11:40 150 gallons used; no return
47					End of Boring at 42' bgs	TD = 42' bgs Sand = 42 - 30' Bentonite = 30 - 25.8' Screen = 42 - 32' Grout mix = 25.8 - 0' Centralizer = 42' & 32'
52						
57						
62						
67						

ch2m:

Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	**Boring ID** WBP-MW9	Sheet 1 of 4

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** WBP
Weather: NA **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic 6" Rods
Water Level: Dry **Start Date & Time:** 7/19/18 at 15:34 **End Date & Time:** 7/19/18 at 165:42 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-2	2	S1	CL	0 - 1' - **CL**: lean clay, topsoil, very dark gray, (2.5Y 3/1), dry, stiff, trace organics 1 - 2.5' - **CL**: lean clay, olive brown (2.5Y 4/3), dry, very stiff, trace gravel and sand	5.5 ppm - 0.8 ppm 3.0 ppm 2.1 ppm
5	2-5	3	S2	CL	2.5 - 6.5' - **CL**: lean clay, brown (10YR 4/3), moist, very stiff, trace gravel and sand, weathered bedrock in foot of barrel	- 0.8 ppm 2.0 ppm 2.6 ppm
	5-6.5	1.5	S3	CL		2.3 ppm - 1.0 ppm
10					End of boring at 6.5' bgs See rock core log for bedrock drilling details.	VOCs 1.5 ppm in empty clean bag (not sealed or tested for increases after sitting in the sun) In breathing zone after casing is set: O2 - 20.9% LEL - 0% CO - 4 ppm H2S - 0 ppm VOCs - 1.0 No change from BZ to hole DR added water
15						
20						
25						
30						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID WBP-MW9	Sheet 2 of 4

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** West Burn Pads
Weather: NA **Drilling Contractor:** Cascade
Drilling Method and Equipment Used:
Water Level: N/A **Start Date & Time:** 8/1/2018 at 08:45 **End Date & Time:** 8/2/2018 at 09:11 **Logged By:** M. Tekle

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
12	R1 7-12 95%	78% Fair	10+ 4 2 2 2	7 - 7.6' - Fracture Zone 8.2', 8.3' - F, 0 degrees, R, P 8.6' - F, 0 degrees, R, P, some clay 9.2' - F, 10 degrees, R, S 9.6' - F, 0 degrees, R, P 10.2' - F, 0 degrees, R, P, some clay 10.5', 10.7' - discontinuous along shale beds, washed out a little bit	7 - 12' - Limestone with few shale and clay, very light gray (N8), medium gray (N5), and yellowish orange from 9.6 - 10.2', medium to fine grained, slightly weathered to highly weathered at 8.2 - 8.4', 10 - 10.1', and 11.2', strong to medium strong, clay layers at 8.3', 8.9', and 11'	R1: 08:45 - -09:05 105 gallons used; 100% return
17	R2 12-17 96%	71% Fair	1 10+ 3 2 3	12.5' - F, 0 degrees, R, P 13 - 13.6' - Fracture zone, weathering and discoloration 14.2' - discontinuities along the shale bedding, 0 degrees, R, P 14.5' - F, 0 degrees, R, P, moderately weathered 15.1' - F, 0 degrees, R, P 15.8' - F, 0 degrees, R, P 16.1' - F, 0 degrees, R, P 16.2' - F, ~15 degrees, R, U 16.4' - F, 0 degrees, R, P	12 - 14.2' - Limestone, yellowish gray (5Y 8/1), fine to medium grained, slightly to moderately weathered, medium strong 14.2 - 14.6' - Shale with limestone, medium gray (N5), shale with few limestone, moderately weathered, weak 14.6 - 17' - Limestone, very light gray (N8) to medium light gray (N6), very fine to fine grained with few shale lamination, slightly weathered, strong	R2: 09:12 - 09:30 90 gallons used; 100% return
	R3 17-18.1 100%	73% Fair	2	17.1' - F, 0 degrees, R, P 17.6' - F, 0 degrees, R, P 17.9' - F, 0 degrees, R, U	17 - 17.9' - Same as above, color change to medium light gray (N6) 17.9 - 18.1' - Shale, medium dark gray (N4), moderately weathered, weak	R3: 09:48 - 09:55 20 gallons used; 100% return
22	R4 18.1-22 88%	65% Fair	1 NR NR NR	18.3' - Discontinuities along the shale bedding, 0 degrees, R, P 19.3' - F, 0 degrees, R, P 19.8', 19.9' - F, ~5 degrees, R, P, sign of weathering and color change to yellowish orange 20.6' - F, 0 degrees, R, P, color change to yellowish orange 20.8' - F, 0 degrees, R, P 21' - F, 0 degrees, R, P 21.5' - F, 0 degrees, R, P, color change to yellowish orange	18.1 - 22' - Limestone, medium light gray (N6) to medium gray (N5), very fine grained to medium grained, lamination, slightly weathered at 19.8', 20.6', and 21.5', medium strong. Shale layers at 21.1 - 21.2' and 21.4 - 21.5'	R4: 09:58 - 10:15 80 gallons used; 100% return
27	R5 22-27 100%	78% Good	1 3 1 4 10+	22.5' - F, 0 degrees, R, P 23.3' - F, 0 degrees, R, P 23.6', 23.7' - F, 0 degrees, R, P 24' - F, 0 degrees, R, P 25.3', 25.4' - F, 0 degrees, R, U 25.6' - Discontinuity along the shale bedding 25.8' - Discontinuity along the shale bedding 26.1 - 26.5' - Fracture Zone	22 - 27' - Limestone, very light gray (N8) to medium gray (N5), fine to medium grained, slightly weathered, strong, shale layer from 25.7 - 25.9', medium dark gray (N4)	R5: 10:20 - 10:42 105 gallons used; 60% return til 24.5' and no return from 24.5 - 27'
	R6 27-28.8 95%	69% Fair	1 2	27.6' - F, 0 degrees, R, P 28.2 - 28.4' - Lean clay layer	27 - 27.3' - Same as above 27.3 - 28.2' - Shale with few limestone, medium dark gray (N4), slightly weathered, medium strong	R6: 10:54 - 11:00 50 gallons used; no return
32	R7 28.8-32 100%	96% Excellent	0 1 2	30.1' - F, 0 degrees, R, P 30.9' - F, 25 degrees, R, U 31.1' - F, 0 degrees, S, P 31.5' - F, 0 degrees, S, P	28.2 - 28.4' - Lean clay, medium dark gray (N4), highly weathered, weak 28.4 - 28.8' - Same as 27.3 - 28.2' 28.8 - 31.9' - Same as 27.3 - 28.2' 31.9 - 32' - Few limestone	R7: 11:08 - 11:17 110 gallons used; no return
37	R8 32-37 98%	66% Fair	0 3 5 3 1	33' - F, 0 degrees, R, P, discontinuity along shale bedding 33.4' - F, 0 degrees, R, P 33.8' - F, 0 degrees, R, P, discontinuity along shale bedding 34.1 - 34.2' - discontinuity along shale bedding 34.7' - F, 10 degrees, R, U 34.9' - F, 15 degrees, R, P, discontinuity along shale bedding 35.2' - F, 0 degrees, R, P 35.4' - F, 0 degrees, R, P 35.6' - F, 0 degrees, R, U 36.1' - F, 0 degrees, R, U	32 - 33.1' - Limestone, medium light gray (N6), fine to medium grained, lamination, slightly weathered, strong 33.1 - 36.1' - Shale with few limestone interbedding, dark gray (N3) to medium light gray (N6), slightly weathered, fine grained to medium grained, weak to medium strong 36.1 - 37' - Same as 32 - 33.1'	R8: 11:25 - 11:45 125 gallons used; no return

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID WBP-MW9	Sheet 3 of 4

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork — **Site Location:** West Burn Pads
Weather: NA — **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic HQ Wireline
Water Level: N/A — **Start Date & Time:** 8/1/2018 at 08:45 — **End Date & Time:** 8/2/2018 at 09:11 — **Logged By:** M. Tekle

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R9 37-38.1 100%	100% Excellent	0 0	39.2' - F, 0 degrees, R, P 39.4' - F, 10 degrees, R, U 39.6' - F, 0 degrees, R, P, discontinuity along shale bedding 39.9' - F, 0 degrees, R, U 40.3' - F, 0 degrees, R, P 41' - F, 0 degrees, R, P	38.1 - 42' - Limestone with shale, medium light gray (N6) to dark gray (N3), very fine grained, slightly weathered, medium strong, shale layer and interbedding 39.2 - 40'	R10: 13:25 - 13:45 115 gallons used; no return
42	R10 38.1-42 98%	84% Good	4 3 0			
47	R11 42-47 100%	96% Excellent	2 0 1 1 1	42.6 - 42.8' - Lean clay layer 44.2' - F, 0 degrees, P, R 45.7 - F, 0 degrees, P, S, discontinuity along shale bedding 46.2 - F, 0 degrees, P, R	Same as above, shale layer and lamination from 42.6 - 44.9' and 45.5 - 47'	R11: 13:48 -14:07 125 gallons used; no return
	R12 47-50.5 93%	90% Excellent	1 0 1	47.3' - F, 0 degrees, R, P 49.8' - F, 0 degrees, R, P	47 - 50.5' - Limestone with shale layer, light gray (N7) to medium gray (N5), fine to medium grained, slightly weathered, medium strong, shale layer at 48.4 - 48.6' and laminations 50 - 50.5'	R12: 14:15 - 14:45 110 gallons used; no return PID reading along the fracture at ~50' = 2.4 ppm
52	R13 50.5-52 100%	100% Excellent	3 0	50.5 - 52' - Limestone with few shale lamination, light gray (N7), very fine grained, slightly weathered, medium strong		R13: 14:50 - 15:00 50 gallons used; no return
	R14 52-55.2 100%	96% Excellent	0 1 2	53.7' - F, 0 degrees, R, P 54.1' - F, 0 degrees, R, U 54.5' - F, 0 degrees, R, U	Same as above, shale layer 54.9 - 55.1', medium grain size from 52.8 - 55'	R14: 15:08 - 15:30 140 gallons used; no return
57	R15 55.2-57 100%	39% Poor	3 3	55.6' - F, 0 degrees, R, P, discontinuity along shale beddings, slightly weathered 55.9' - F, 0 degrees, R, P 56.1' - F, 0 degrees, R, P 56.3' - F, 10 degrees, R, P 56.6' - F, 0 degrees, R, P 56.8' - F, 0 degrees, R, P	55.2 - 57' - Limestone with few shale layers, light gray (N7), very fine grained, slightly weathered, medium strong, calcite at 56.8 - 57'	R15: 15:48 - 16:05 70 gallons used; no return
62	R16 57-62 100%	88% Good	1 1 0 3 1	57.6' - F, 0 degrees, R, P 58.1' - F, 0 degrees, R, P 60.6 - 61.2' - Fracture zone, moderately weathered along the shale bedding	57 - 62' - Limestone with few shale layers, light gray (N7), fine grained, slightly weathered, medium strong, calcite at 57 - 57.6' and 59.5 - 60.1'	R16: 16:10 - 16:35 160 gallons used; no return
67	R17 62-67 93%	78% Good	2 2 1 0 2	62.8' - F, 0 degrees, R, P 63.2' - F, 0 degrees, R, P 63.6' - F, 10 degrees, R, U 63.8' - F, 0 degrees, R, P 64.6' - F, 0 degrees, R, P 66.3 - 66.5' - F, 0 degrees, R, U	62 -62.5' - Same as above 62.5 - 63.8' - Shale, light bluish gray (5B 7/1), very fine grained, few pores on the surface, slightly weathered to moderately weathered, medium to weak 63.8 - 67' - Limestone with shale layers, very light gray (N8) to meidum gray (N5), very fine to medium grained, pores at 63.9 - 64', shale layers at 64.4 - 64.6', 64.6 - 64.7', 65 - 65.1', 65.6 - 65.7', and 66.4 - 66.5', slightly weathered, fine to medium grained, medium strong	R17: 16:43 - 17:00 120 gallons used; no return

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID WBP-MW9	Sheet 4 of 4

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** West Burn Pads
Weather: NA **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic HQ Wireline
Water Level: N/A **Start Date & Time:** 8/1/2018 at 08:45 **End Date & Time:** 8/2/2018 at 09:11 **Logged By:** M. Tekle

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous: Core Description — Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
72	R18 67-72 100%	100% Excellent	0 0 1 0 1	69.3' - F, 0 degrees, R, P 71.1' - F, 0 degrees, R, U, moderately weathered and staining	67 - 69.7' - Same as above 69.7 - 70.3' - Shale, greenish gray (5 GY 6/1), very fine grained, slightly weathered, strong 70.3 - 72' - Same as 63.8 - 67', few shale layers	R18: 07:58 - 08:08 105 gallons used; no return
77	R19 72-77 100%	100% Excellent	0 1 2 0 1	73.3' - F, 5 degrees, R, P 74.3' - F, 0 degrees, R, P 76.7' - F, 0 degrees, S, P	72 - 77' - Limestone with shale layer at 76 - 76.3', very light gray (N8) to light gray (N7), medium grained 73.5 - 75' and fine grained from 75 - 77', pores from 73.5 - 75' and 76 0 76.5', slightly weathered, strong	R19: 08:15 - 08:27 105 gallons used; no return
82	R20 77-82 100%	100% Excellent	1 1 1 1 1	78.9' - F, 0 degrees, S, P 79.3' - Discontinuity along shale bedding, moderately weathered, partly healed 80.6' - F, 0 degrees, S, P 81.2' - Discontinuity along shale bedding, moderately weathered, partly healed	77 - 78.5' - Same as above 78.5 - 79.3' - Shale, light bluish gray (5B 7/9), very fine grained. Few pores, slightly weathered, strong 79.3 - 82' - Limestone with few shale layers, very light gray (N8), LS and medium bluish gray (5B 5/1) shale, fine to medium grain, slightly weathered, medium to strong odor	R20: 08:50 - 09:11 105 gallons used; no return
87					End of rock coring at 82' bgs	TD = 82' bgs Screen - 80 - 70' Sand - 82 - 68' Bentonite - 68 - 62.5'
92						
97						

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: G-30		Site: WBP	
Field Crew: J. Hanson, D. Johnson		Date: 3/8/19	Project #: 679172CH 01.02.DP.02
Well Depth (ft.): 18.48	Purge Methodology: LOW FLOW		
DTW (ft.): 11.52			
Water Column (ft.):			
Well Diameter (in.): 4			
Gal. per ft.:	Water Quality Meter:		
Well Volume (gal.):			

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin purge ~~1515~~ 1523

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1526	12.59	500	0.5	7.65	8.3	0.641	158.1	8.70	12.5	
	1529	12.65	150	0.6	7.70	7.7	0.714	161.7	7.38	9.78	Bubbles in line
	1532	12.78	150	0.7	7.69	7.8	0.700	161.7	7.23	9.90	(reduce flow rate)
	1535	12.86	100	0.8	7.70	7.8	0.713	162.5	7.00	7.13	Bubbles in line
	1538	12.89	100	0.9	7.70	7.9	0.714	162.7	6.70	7.39	" "
	1543	12.92	100	1.0	7.68	7.8	0.713	164.5	6.64	9.10	" "
	1546	12.95	100	1.1	7.66	7.8	0.717	164.6	6.65	9.92	" "
Post-Purge											

Remarks: Pump Intake Depth: 18 ft   Control Box Setting (Hz):   Sampling: (Sample at 100-250 ml/min)

PID BZ = 0.0 ppm

SAMPLING

Depth to Water Before Sampling: 12.95
Sample Methodology: Peristaltic
Sample Name: G-30-0319   QC Sample: —
Sample Date/Time: 3/8/19 1550
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N   Filter Size:
Sample Observations:
Parameters: Explosives, VOCs

ch2m:

RESAMPLE : VOCs

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: G-30		Site: WBP	
Field Crew: R. CAIRD		Date: 3/23/2019	Project #: 679172CH002.DP.02
Well Depth (ft.): 18.48' BTOC	Purge Methodology:	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
1349 DTW (ft.): 12.50' BTOC	LOW-FLOW	2" / .163	5" / 1.020
Water Column (ft.): 5.98'	PERI PUMP	3" / .367	6" / 1.469
Well Diameter (in.): 4"	C102516	4" / .653	8" / 2.611
Gal. per ft.: 0.653 GAL/FT	Water Quality Meter:		
Well Volume (gal.): 3.90 GAL	C103142		
WL METER C103091			

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1400	11.60'	200	0.15							PUMP STOPPED 1400-1401
	1403	11.30	200	0.25	7.64	8.7	0.50	28.4	7.78	NM	RC SLIGHT HC ODOR
	1406	11.61'	200	0.40	7.61	8.7	0.50	36.6	7.64		
	1409	11.89'	200	0.55	7.59	8.9	0.51	45.5	7.32		
	1412	11.91'	200	0.70	7.55	9.0	0.51	46.7	7.08		
	1415	12.05'	200	0.85	7.62	9.0	0.51	49.9	7.19		
Post-Purge											

Remarks: Pump Intake Depth: 15' BTOC   Control Box Setting (Hz): NA   Sampling: (Sample at 100-250 ml/min)

START PUMP 1357

D.O. READINGS UNUSUAL.

NM = NOT MEASURED. SEE INITIAL PURGE LOG

SAMPLING

Depth to Water Before Sampling: 12.05' BTOC

Sample Methodology: PERISTALTIC

Sample Name: G-30-R0319   QC Sample: —

Sample Date/Time: 3/23/2019 1418

Sampler / Signature: R Caird

Filtered Metals Collected: Y / N (N circled)   Filter Size: —

Sample Observations: —

Parameters: VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-23	Site: WBP IAAAP
Field Crew: Joshua Heren	Date: 3/22/19 Project #:

Well Depth (ft.): 12.10
DTW (ft.): 6.36
Water Column (ft.): 5.74
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.):

Purge Methodology: Peristaltic

Water Quality Meter: YSI # G103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 0934

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0939	7.50	variable	0.25	6.85	5.8	0.787	99.0	1.40	7.13	
	0941	7.50	125	0.4	6.85	5.7	0.782	98.2	1.12	6.40	
	0943	7.50	125	0.5	6.85	5.7	0.783	98.0	1.08	7.04	
	0946	7.50	125	0.6	6.84	5.8	0.780	97.5	1.10	6.98	
	0949	7.50	125	0.7	6.84	5.8	0.781	97.3	1.08	6.30	
Post-Purge											

Remarks: Pump Intake Depth: 11.5 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 125 ml/min

SAMPLING

Depth to Water Before Sampling: 7.50
Sample Methodology: Peristaltic
Sample Name: JAW-23-0349 QC Sample: —
Sample Date/Time: 3/22/19 0950
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size:
Sample Observations: Clear
Parameters: VOCs, metals, explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-24		Site: IAAAP	
Field Crew: Jestine Hansen		Date: 3/22/19	Project #:
Well Depth (ft.): 13.30	Purge Methodology: Peristaltic	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
DTW (ft.): 7.62 (after pump raised)		2" / .163	5" / 1.020
Water Column (ft.):		3" / .367	6" / 1.469
Well Diameter (in.): 2 4		4" / .653	8" / 2.611
Gal. per ft.:	Water Quality Meter: YSI # C-103140		
Well Volume (gal.):			

Begin 1040

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1045	7.80	variable	0.5	7.07	5.6	0.601	60.2	1.86	41.6	
	1049	7.80	175	0.6	7.03	5.6	0.595	50.4	2.04	39.6	
	1053	7.80	175	0.8	7.07	5.5	0.585	24.8	2.63	34.2	
	1057	7.81	175	0.9	7.10	5.6	0.590	20.1	2.58	31.7	
	1100	7.81	175	1.0	7.11	5.6	0.595	18.4	2.41	21.0	
	1103	7.81	175	1.2	7.11	5.7	0.601	16.0	2.38	19.3	
	1106	7.81	175	1.3	7.09	5.7	0.601	16.2	2.34	16.1	
	1109	7.81	175	1.5	7.10	5.8	0.601	20.1	2.36	16.4	
	1112	7.81	175	1.6	7.11	5.8	0.601	21.3	2.35	15.9	
Post-Purge											

Remarks: Pump Intake Depth: 12.5 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 175 ml/min

PID: BZ=0.0 ppm Headspace = 0.0 ppm

SAMPLING

Depth to Water Before Sampling: 7.80

Sample Methodology: Peristaltic

Sample Name: JAW-24-0319

QC Sample: —

Sample Date/Time: 3/22/19 1115

Sampler / Signature:

Filtered Metals Collected: Y / N (circled N) Filter Size: —

Sample Observations:

Parameters: VOCs, metals, explosives

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-25
Field Crew: Lina Prdi

Site: JAAAP
Date: 3/19/19 Project #:

7.75 Well Depth (ft.): ~~16.64~~ 21.94 ft
DTW (ft.): ~~8.81 ft~~ 8.62 ft (LP)
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: peri pump

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1233	8.66			6.45	9.8°C	0.503	133	2.26	25.2	
	1235	8.74	100		6.43	9.5	0.503	136.2	2.25	25.0	
	1239	8.81	150		6.44	9.6	0.501	140.6	2.17	24.9	
	1242	8.98	150		6.43	9.9	0.502	142.9	2.17	19.4	
	1245	9.18	200		6.41	9.9	0.501	145.0	2.21	17.2	
	1248	9.43			6.41	9.9	0.501	146.4	2.20	20.2	
	1251	9.75			6.41	10.0	0.501	148.5	2.15	15.5	
	1254	9.80			6.39	10.0	0.500	150.2	2.09	14.0	
	1259	9.98			6.38	9.9	0.500	152.2	2.04	14.4	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

stable @ ~~1300~~ 1259 (LP)
sample @1300

SAMPLING

Depth to Water Before Sampling: ~~8.81 ft~~ (LP) ~~8.62 ft~~ (LP) 9.98 ft
Sample Methodology: peri pump
Sample Name: JAW-25-0319 QC Sample: NA
Sample Date/Time: 3/19/19 1300
Sampler / Signature: Lina Prdi
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: explosives and VOCs

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-99-1		Site: WBP	
Field Crew: J Hansen L Pade		Date: 3/9/19	Project #:
Well Depth (ft.): 38	Purge Methodology: Bladder pump	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 27.89			
Water Column (ft.):			
Well Diameter (in.):			
Gal. per ft.:	Water Quality Meter: #C103142		
Well Volume (gal.):			

Field Parameters

0915

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	924	28.70	200	0.5	7.13	9.2	1.19	172.3	7.59	78.1	
	0927	28.75	200	0.6	7.14	9.4	1.18	171.5	6.79	69.4	
	0930	28.78	200	0.7	7.15	9.4	1.18	170.8	6.61	78.9	
	0933	28.83	200	0.8	7.14	9.5	1.18	170.2	6.68	84.7	
	0936	28.88	200	0.9	7.14	9.5	1.18	170.2	6.66	~~78~~ 76.1	
	0939	28.92	200	1.0	7.14	9.3	1.17	170.1	6.59	76.8	
Post-Purge											

Remarks: Pump Intake Depth: 36 ft

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 200 ml/min

SAMPLING

Depth to Water Before Sampling: 28.92

Sample Methodology: Bladder

Sample Name: ~~WBP MW~~ WBP-99-1-0319

QC Sample: —

Sample Date/Time: 3/9/19 0940

Sampler / Signature: [signature]

Filtered Metals Collected? Y / N Filter Size:

Sample Observations:

Parameters: Explosives, VOCs

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-99-2		Site: WBP IAAAP	
Field Crew: Jestin Hansen		Date: 3/19/19	Project #:
Well Depth (ft.): 27.15	Purge Methodology: Peristaltic	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
DTW (ft.): 19.40		2" .163	5" 1.020
Water Column (ft.):		3" .367	6" 1.469
Well Diameter (in.): 2		4" .653	8" 2.611
Gal. per ft.:			
Well Volume (gal.):	Water Quality Meter: YSI # C103142		

Begin 1448

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1451	19.51	variable	0.5	7.17	12.8	1.04	172.8	5.73	1.03	
	1454	19.49	125	0.6	7.22	12.8	1.04	171.9	4.80	1.20	
	1457	19.49	125	0.7	7.19	12.7	1.04	166.9	4.71	0.80	
	1500	19.50	125	0.8	7.20	12.6	1.04	~~170.3~~ 170.5	4.74	0.93	
	1503	19.50	125	0.9	7.17	12.6	1.04	174.0	4.73	0.72	
Post-Purge											

Remarks: Pump Intake Depth: 26 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling: 19.50

Sample Methodology: Peristaltic

Sample Name: WBP-99-2-0319 QC Sample: —

Sample Date/Time: 3/19/19 1505

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N Filter Size: —

Sample Observations: Clear

Parameters: Explosives, VOCs

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-99-4
Site: JAAAP
Field Crew: Lora Prdi
Date: 3/22/19 Project #:

Well Depth (ft.): 27.15
DTW (ft.): 12.88
Water Column (ft.):
Well Diameter (in.): 2in
Gal. per ft.: .163
Well Volume (gal.):

Purge Methodology: low flow peri pump

Water Quality Meter: C-1029364

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1515	13.49	100		7.15	12.8	1.03	105.1	3.8	1.31	
	1518	13.66	100		7.12	12.9	1.03	102.6	3.3	2.05	
	1521	14.03	150		7.09	12.3	1.03	101.2	3.5	1.62	
	1524	14.23	150		7.09	12.1	1.04	100.9	3.3	1.17	
	1527	14.47	150		7.08	12.0	1.04	100.8	3.3	1.88	
	1530	14.78	150		7.08	11.9	1.04	100.0	3.4	0.98	
	1533	15.28	200		7.07	12.1	1.03	99.2	3.3	2.14	
	1535	15.46	200		7.07	11.9	1.03	99.1	3.4	0.79	
	1538	15.70	200		7.09	11.8	0.98	99.2	4.2	0.93	
	1541	15.83	150		7.09	11.8	0.97	100.3	4.5	1.09	
	1544	15.94	150		7.09	11.8	0.99	101.5	4.4	2.37	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @1544
samples collected @ 1548

SAMPLING

Depth to Water Before Sampling:
Sample Methodology: low flow peri pump
Sample Name: WBP-99-4-0319 QC Sample:
Sample Date/Time: 3/22/19 1548
Sampler / Signature: Lora Prdi
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-99-5		Site: WBP IAAAP	
Field Crew: Jestina Hansen		Date: 3/7/19	Project #:
Well Depth (ft.): 23 ft	Purge Methodology: Peristaltic Low Flow	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 10.30			
Water Column (ft.):			
Well Diameter (in.):			
Gal. per ft.:	Water Quality Meter:		
Well Volume (gal.):			

Purge initiate @ 1129

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1134	10.80	variable	0.5	6.84	7.6	1.20	-90.6	0.22	71.1	Light gray
	1138	10.80	300	0.7	6.90	7.5	1.20	-96.6	0.22	41.7	" "
	1142	10.80	300	0.9	6.84	7.5	1.19	-105.7	0.78	35.6	" "
	1145	10.80	300	1.1	6.86	7.5	1.19	-107.3	0.52	31.9	" "
	1148	10.80	300	1.3	6.86	7.5	1.19	-109.3	0.28	28.8	
	1151	10.80	300	1.5	6.84	7.5	1.18	-110.1	0.24	27.9	
	1154	10.80	300	1.7	6.83	7.5	1.18	-110.3	0.26	27.0	
Post-Purge											

Remarks: Pump Intake Depth: 20 ft Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling: 10.80

Sample Methodology: Peristaltic Low Flow

Sample Name: WBP-99 QC Sample: —

Sample Date/Time: 3/7/19 1200

Sampler / Signature: [signature]

Filtered Metals Collected: Y / (N) Filter Size:

Sample Observations:

Parameters: Explosives, VOC, metals

6

ch2m:

RESAMPLE VOCs

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-99-5

Field Crew: R.CAIRD

Site: WBP

Date: 3/23/2019 Project #: 679172CH.01.02.DP.02

Well Depth (ft.): ~~23~~ 22.90' BTOC

1305 DTW (ft.): 10.40

Water Column (ft.): 12.5

Well Diameter (in.): 2

Gal. per ft.: 0.163

Well Volume (gal.): 2.0375 gal

WL METER C103091

Purge Methodology: PERI PUMP LOW-FLOW C102516

Water Quality Meter: C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1315	10.69	200	0.15	6.66	9.6	0.87	-90	3.21	NM	CLEAR
	1318	10.69	200	0.3	6.68	9.5	0.87	-98.2	1.38		
	1321	10.69	200	0.45	6.74	9.5	0.87	-103.9	0.77		
	1324	10.69	200	0.6	6.77	9.4	0.87	-105.5	0.69		
	1327	10.69	200	0.75	6.70	9.3	0.86	-106.7	0.64		
Post-Purge											

Remarks: Pump Intake Depth: 18' BTOC Control Box Setting (Hz): NA Sampling: (Sample at 100-250 ml/min)

PUMP START 1312

NM = NOT MEASURED. SEE INITAL PURGE LOG

SAMPLING

Depth to Water Before Sampling: 10.69' BTOC

Sample Methodology: PERISTALTIC

Sample Name: WBP-99-5-R0319 QC Sample: —

Sample Date/Time: 3/23/2019 1330

Sampler / Signature: RC

Filtered Metals Collected: Y (N) Filter Size: —

Sample Observations: —

Parameters: VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-99-6	Site: IAAAP
Field Crew: Jestina Hansen	Date: 3/22/19 Project #:

Well Depth (ft.): 42
DTW (ft.): 27.00 (Initial)
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.):

Purge Methodology: Bladder Low Flow

Water Quality Meter: YSI#C103140

Diameter	Gal. Per Foot
2"	.163
3"	.367
4"	.653
5"	1.020
6"	1.469
8"	2.611

Begin 1509

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1513	29.30	400	0.4	7.02	12.3	0.84	1.9	1.27	11.2	
	1522	33.0	250	1.2	7.10	13.1	0.83	-9.8	0.57	17.1	
	1525	32.85	250	1.5	7.13	13.2	0.73	-9.4	0.75	15.9	
	1528	32.80	250	1.7	7.15	13.2	0.70	-9.1	0.72	15.2	
	1531	32.78	250	1.9	7.16	13.2	0.73	-8.7	0.76	15.4	
Post-Purge											

Remarks: Pump Intake Depth: 40 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 250 ml/min

*Initial DTW is after drawing down w/ peristaltic

SAMPLING

Depth to Water Before Sampling: 32.7
Sample Methodology: Bladder
Sample Name: WBP-99-6-0319 QC Sample: —
Sample Date/Time: 3/22/19 1535
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations: Clear
Parameters: Explosives, VOCs, [illegible]

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-99-6		Site: WBP IAAAP	
Field Crew: Joshua Hansen		Date: 3/22/19	Project #:
Well Depth (ft.): 42.90	Purge Methodology: Peristaltic	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 17.33			
Water Column (ft.): 29.57			
Well Diameter (in.): 2			
Gal. per ft.: 0.163	Water Quality Meter: YSI #C103140		
Well Volume (gal.): 4.8			

Begin 0845

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0850	15.44	variable	0.5	7.40	8.9	0.76	122.5	0.90	21.7	
	0853	15.58	125	0.6	7.42	9.9	0.78	101.4	0.73	19.3	Insufficient recharge ↑ flow rate to reduce recharge
	0905	24.38	450	2	7.42	10.6	0.82	25.1	0.44	11.2	Try low flow
	0908	24.50	400	2.1	7.43	10.0	0.84	17.7	0.57	9.83	Insufficient recharge
	0917	28.13	160	3.7	7.45	9.8	0.84	17.1	0.51	10.1	
	0920	28.28	100	3.8	7.45	9.7	0.83	16.9	0.54	7.23	
		29 ft — peri pump failed. Will have to return with bladder pump									
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling:
Sample Methodology:
Sample Name: QC Sample:
Sample Date/Time:
Sampler / Signature:
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters:

ch2m:

TO BE RESAMPLED W/ BLADDER

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-MW1	Site: IAAAP
Field Crew: Lora Prado	Date: 3/19/19 Project #:

Well Depth (ft.): 48.55ft
DTW (ft.): 10.21 ft
Water Column (ft.):
Well Diameter (in.): 2in
Gal. per ft.: .163
Well Volume (gal.):

Purge Methodology:

Water Quality Meter:

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1422	13.66	125		7.01	11.2	0.690	-36.3	~~8.70~~ 0.95	4.65	
	1425	14.20	200		7.01	10.9	0.690	-17.1	1.37	1.17	
	1428	15.04	200		7.02	11.2	0.690	-3.8	1.73	0.95	
	1431	15.80	200		7.02	11.3	0.690	11.4	2.15	1.19	
	1435	16.71	200		7.02	11.3	0.690	7.4	2.14	0.77	
	1438	17.60	200		7.01	11.2	0.690	20.9	2.09	0.94	
	1442	18.41	200		7.02	11.3	0.690	29.1	2.09	1.40	
	1445	19.14	200		7.01	11.3	0.690	26.3	2.29	1.07	
	1448	19.71	200		7.01	11.4	0.690	24.7	2.31	1.12	
	1451	20.39	200		7.01	11.5	0.690	21.5	2.26	1.85	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @1451
samples taken @1455

SAMPLING

Depth to Water Before Sampling:
Sample Methodology: low flow peri pump
Sample Name: WBP-MW1-0319 QC Sample:
Sample Date/Time: 03/19/19
Sampler / Signature: Lora Prado
Filtered Metals Collected: Y / N (N circled) Filter Size:
Sample Observations:
Parameters: explosives, VOCs and RCRA Metals

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-MW1		**Site:** WBP	
Field Crew: Jestina Hansen		**Date:** 3/23/19	**Project #:**
Well Depth (ft.): 48.50	Purge Methodology: QED Bladder Pump	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 7.73 (after pump insert)			
Water Column (ft.):			
Well Diameter (in.): 2			
Gal. per ft.:	Water Quality Meter: C103140		
Well Volume (gal.):			

Begin ~~0947~~ 0950

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0953	10.07	250	0.3	7.18	10.1	0.69	-49.0	0.60	17.3	
	1010	21.72	400	2	7.21	10.2	0.69	-6.1	1.12	11.8	
	1030	33.40	400	4	7.25	10.4	0.70	17.3	1.59	9.32	↑ flow to reach just above
	1033	33.56	100	4.1	7.25	10.4	0.70	17.8	1.61	9.11	screen, then try low-flow &
	1042	38.92	400	5	7.25	10.2	0.70	18.9	1.51	7.37	↓ flow rate to check recha
	1045	38.92	~~100~~ 150	5.1	7.25	10.2	0.70	19.1	1.48	2.51	
	1048	38.94	150	5.3	7.25	10.2	0.70	19.1	1.46	2.89	
	1051	38.95	150	5.4							
Post-Purge											

Remarks: Pump Intake Depth: 46 ft bgs — Control Box Setting (Hz): — Sampling: (Sample at 100-250 ml/min) 150 ml/min

* Based on prior purge attempt, will draw down to ~33 ft btoc where other similarly screened wells began showing recharge, then attempt low flow

SAMPLING

Depth to Water Before Sampling: 38.95

Sample Methodology: Bladder

Sample Name: WBP-MW1-0319 QC Sample: ——

Sample Date/Time: 3/23/19 1055

Sampler / Signature: [signature]

Filtered Metals Collected Y / N (N circled) Filter Size: ——

Sample Observations: Clear

Parameters: VOCs, explosives, metals

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-MW2
Site: IAAAP
Field Crew: Jesten Hansen
Date: 3/22/19 **Project #:**

Well Depth (ft.): 43.50
DTW (ft.): 0.00 ft btoc
Water Column (ft.): 43.50
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.): 7.1

Purge Methodology: Peristaltic

Water Quality Meter: YSI # C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1159

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1205	5.53	Variable	0.5	7.27	10.3	0.78	-40.1	1.72	31.2	In
	1208	5.65	125	0.6	7.21	10.5	0.74	-43.3	1.25	27.1	Insufficient recharge. ↑ flow rate to induce recharge
	1228	20.10	100	3.25	7.19	10.4	0.73	-49.8	0.23	5.16	↓ rate to check recharge
	1231	20.53	100	3.3	7.18	10.4	0.73	-49.9	0.21	5.03	Insufficient recharge, ↑ ra
	1252	Peristaltic failed at 30 ft btoc - switch to bladder pump									
	1301	— Begin purge with bladder pump									
	1307	33.8	400	6.25	7.20	11.4	0.74	-41.9	0.91	9.21	
	1310	33.8	300	6.5	7.20	11.2	0.74	-42.0	0.87	8.37	
	1313	33.8	300	6.7	7.20	11.2	0.74	-42.4	0.89	8.41	
Post-Purge											

Remarks:

Pump Intake Depth: 42 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 250 ml/min

SAMPLING

Depth to Water Before Sampling: 33.80
Sample Methodology: Bladder
Sample Name: WBP-MW2-0319 QC Sample: —
Sample Date/Time: 3/22/19 1315
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations:
Parameters: VOC, metals, explosives

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-MW3
Site: FAAAP
Field Crew: Destin Hansen
Date: 3/23/19
Project #:

Well Depth (ft.): 53.40
DTW (ft.): 36.70
Water Column (ft.):
Well Diameter (in.):
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: QED Bladder Pump

Water Quality Meter: YSI #C103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1347

Field Parameters

Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial 1352	39.12	0.5	Zeroed	7.20	11.9	0.77	-22.4	2.12	81.1	
1356	40.32	400	0.6	7.22	12.1	0.76	-26.0	0.65	91.7	
1401	41.56	400	1	7.25	11.9	0.76	-29.8	0.40	81.6	
1404	41.70	100	1.1	7.27	12.9	0.75	-34.1	0.46	92.9	
1419	45.08	400	2.25	7.34	12.4	0.67	-18.0	0.99	83.9	
1423	45.12	100	2.3	7.35	13.0	0.68	-18.6	1.56	96.6	
1426	45.18	100	2.4	7.36	13.4	0.68	-18.9	1.52	93.0	
1429	45.25	100	2.4	7.35	13.9	0.70	-20.0	1.19	181	
1432	45.30	100	2.5	7.33	14.3	0.71	-21.8	1.15	141	
1435	45.33	100	2.6	7.33	14.5	0.70	-21.9	1.14	165	
Post-Purge										

Remarks:

Pump Intake Depth: 50 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 100 ml/min

PID: BZ = 0.0 ppm Headspace = 0.0 ppm

SAMPLING

Depth to Water Before Sampling: 45.33
Sample Methodology: Bladder Pump
Sample Name: WBP-MW3
QC Sample: —
Sample Date/Time: 3/23/19 ~~1435~~ 1440
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations: Clear
Parameters: VOCs, Explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-MW8		Site: IAAAP	
Field Crew: Jestin Hansen		Date: 3/23/19	Project #:
Well Depth (ft.): 44.85	Purge Methodology: QED Bladder pump	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
DTW (ft.): 30.6 (after pump insert)		2" / .163	5" / 1.020
Water Column (ft.):		3" / .367	6" / 1.469
Well Diameter (in.): 2		4" / .653	8" / 2.611
Gal. per ft.:	Water Quality Meter: YSI C103140		
Well Volume (gal.):			

Begin 1146

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1154	32.40	varied	0.5	7.32	11.9	0.619	21.3	7.50	423	
	1157	32.40	100	0.6	7.32	11.0	0.622	33.9	7.60	478	
	1201	32.38	100	0.7	7.30	11.0	0.622	36.6	7.46	405	
	1205	32.38	100	0.8	7.30	11.1	0.623	-1.0	6.94	368	
	1209	32.38	100	0.9	7.30	11.1	0.623	+3.2	6.85	296	
	1220	32.37	100	1.1	7.31	11.0	0.623	9.0	6.89	170	
	1230	32.36	100	1.3	7.30	10.7	0.627	17.2	6.29	97.6	
	1250	32.36	100	1.6	7.30	10.7	0.628	19.7	4.09	35.4	
	1253	32.36	100	1.6	7.28	10.6	0.628	19.5	4.07	34.8	
	1256	32.36	100	1.7	7.27	10.6	0.628	19.7	4.03	33.9	
Post-Purge											

Remarks: Pump Intake Depth: 42 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 100 ml/min

PID: BZ=0.0 ppm Headspace = 0.0 ppm

SAMPLING

Depth to Water Before Sampling: 32.36

Sample Methodology: Bladder

Sample Name: WBP-MW8-0319 QC Sample: —

Sample Date/Time: 3/23/19 1300

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N (N circled) Filter Size: —

Sample Observations: Clear

Parameters: VOC, ~~metals~~, explosives

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-MW9		Site: IAAAP	
Field Crew: Jestina Hansen		Date: 3/23/19	Project #:

Well Depth (ft.): 81
DTW (ft.): 11.30
Water Column (ft.): 69.7
Well Diameter (in.): 2
Gal. per ft: 0.163
Well Volume (gal.): 11.3

Purge Methodology: Bladder Pump QED

Water Quality Meter: YSI #C103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1530

Field Parameters

	Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1535	13.72	400	0.5	7.28	13.1	0.92	-95.8	1.23	225	
	1544	14.98	156	0.7	7.24	13.0	0.90	-97.4	0.79	270	
	1550	15.57	150	0.8	7.24	12.7	0.91	-98.8	0.50	325	
	1553	15.61	100	1	7.24	11.1	0.91	-98.8	0.49	301	
	1558	15.64	100	1.1	7.23	11.2	0.91	-98.6	0.47	284	
	1606	15.65	100	1.2	7.23	11.1	0.91	-98.0	0.43	163	
	1615	15.70	100	1.3	7.23	11.3	0.86	-91.9	0.39	95.0	
	1625	15.76	100	1.5	7.23	11.3	0.84	-88.1	0.34	54.1	
	1628	15.78	100	1.6	7.21	11.1	0.83	-85.6	0.31	50.3	
	1631	15.81	100	1.6	7.21	11.1	0.83	-84.3	0.30	49.0	
	1634	15.83	100	1.7	7.21	11.1	0.81	-82.5	0.28	47.9	
Post-Purge											

Remarks:

Pump Intake Depth: 79 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 100 ml/min

PID = 0.0 ppm HS + BZ

SAMPLING

Depth to Water Before Sampling: 15.83
Sample Methodology: Bladder Pump
Sample Name: WBP-MW9-0319
QC Sample: —
Sample Date/Time: 3/23/19 1635
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N (N circled) Filter Size: —
Sample Observations:
Parameters: VOCs, metals, explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: ~~WBP-MW1~~ WBP-TTMW-01
Site: IAAAP WBP
Field Crew: Lora Prndi
Date: 3/7/19
Project #:

Well Depth (ft.): 6 ft
DTW (ft.): 3.79
Water Column (ft.):
Well Diameter (in.): 1
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: low flow

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	~~1300~~	~~4.34~~				~~4.4~~	~~0.0~~				
	1300	4.34			6.61	3.6	0.656	191.7	4.55	24.0	
	1305	4.49			6.45	3.0	0.680	192.6	3.45	24.3	
	1308	4.62			6.39	2.9	0.696	188.8	2.31	11.5	
	1311	4.75			6.37	2.9	0.710	186.0	2.02	8.58	
	1314	4.79			6.37	3.0	0.738	133.7	1.44	6.37	
	1317	4.83			6.35	3.0	0.778	75.7	1.06	3.23	
	1319	4.92			6.33	3.0	0.810	60.0	0.90	2.55	
	1322	5.20			6.34	3.2	0.826	3.5	0.70	3.88	
			Total: 3 GAL								
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

low flow started @1300

ORP sensor malfunction

SAMPLING

Depth to Water Before Sampling: 3.79
Sample Methodology: low flow
Sample Name: ~~WBP-1-0319~~ WBP-TTMW-01-0319 QC Sample: NA
Sample Date/Time: 3-7-19 1330
Sampler / Signature: Lora Prndi
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: VOCs EXPLOSIVES

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-TT MW02		Site: WBP IAAAP	
Field Crew: Jeth Hansen		Date: 3/7/19	Project #:
Well Depth (ft.): 7 ft	Purge Methodology: Peristaltic Low Flow	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): ~~[illegible]~~ 5.60			
Water Column (ft.):			
Well Diameter (in.): 1"			
Gal. per ft.:	Water Quality Meter: C-103142		
Well Volume (gal.):			

1238 Start Purge

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1240	5.78	variable	0.2	6.90	6.1	1.02	-7.2	1.42	29.8	
	1244	5.78	150	0.3	6.93	6.1	1.04	-0.7	0.85	6.77	
	1248	5.78	150	0.4	6.88	5.8	1.05	-2.4	0.70	5.13	
	1252	5.78	150	0.5	6.87	5.8	1.05	-0.5	0.60	5.40	
	1255	5.76	150	0.6	6.89	6.0	1.05	3.7	0.63	6.00	
	1258	5.75	150	0.7	6.88	6.0	1.04	7.9	0.61	4.17	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling: 5.75

Sample Methodology: Peristaltic

Sample Name: WBP-TTMW02-0319 QC Sample: —

Sample Date/Time: 3/7/19 1300

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N (N circled) Filter Size: —

Sample Observations:

Parameters: VOCs, ~~Total~~ ~~metals~~, explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP - TTMW-03		Site: IAAAP	
Field Crew: Dora Prode		Date: 3/22/19	Project #:
Well Depth (ft.): 8.03	Purge Methodology: low flow peri pump	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 5.91 ft			
Water Column (ft.):			
Well Diameter (in.): 1inch			
Gal. per ft.:	Water Quality Meter:		
Well Volume (gal.):	C-102936	PID: 0.0 ppm	

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	hydrocarbon
Initial	1118	6.43	100		6.96	9°C	1.17	46.9	4.6	50.1	smell
	1121	6.47	60		6.86	9.1	1.17	39.9	2.4	14.9	
	1124	6.42	75		6.81	9.6	1.17	35.0	1.9	7.75	
	1127	6.49	75		6.81	9.8	1.60	28.7	1.6	11.3	
	1130	6.52	75		6.79	9.7	1.40	24.4	1.4	6.06	
	1133	6.47	60		6.79	9.6	1.20	25.7	1.2	3.68	
	1136	6.46	60		6.78	10.0	1.20	21.9	1.2	5.10	
	1139	6.48	60		6.77	10.3	1.20	18.0	1.1	4.29	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @ 1139
samples collected @ 1145

SAMPLING

Depth to Water Before Sampling: 6.48 ft

Sample Methodology: low flow peri pump

Sample Name: WBP-TTMW-03-0319 QC Sample:

Sample Date/Time: 3/22/19 1145

Sampler / Signature: Dora Prode

Filtered Metals Collected: Y / N Filter Size:

Sample Observations:

Parameters: explosives, VOCs and RCRA metal

flush mount

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP - TTMW - 04
Site: IAAAP
Field Crew: Lora Pndi
Date: 3/22/19 Project #:

Well Depth (ft.): 10.11
DTW (ft.): 8.86
Water Column (ft.):
Well Diameter (in.): 1 inch
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: low flow peri pump

Water Quality Meter: C-102936

PID → 0.0 ppm

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0920	9.09	150		6.43	7.0	1.49	39.4	6.8	14.1	
	0923	9.67	100		6.52	7.2	1.63	-41.8	4.6	15.1	
	0926	9.87	100		6.59	7.3	1.68	-42.4	2.6	7.95	
	0928	10.00	100		6.58	7.3	1.69	-36.3	2.1	9.36	
	0931	at bottom 10.02	100		6.62	7.4	1.68	-22.6	2.9	45.5	
			80 ~~well dry cannot sample~~							* started recharging slowly	8
	0934	40 ~~8.03~~	50		6.65	7.4	1.68	-24.6	2.9	26.9	
	0937	9.69	50		6.68	7.0	1.71	-36.3	2.0	14.9	
	0940	9.68	50		6.65	7.0	1.72	-46.6	1.2	9.67	
Post-Purge	0943	9.69	50		6.68	7.1	1.72	-52.9	1.6	7.49	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

0946	9.68	50		6.70	7.2	1.72	-51.7	1.4	7.07

parameters stable @ 0947
samples collected @ 0950

SAMPLING

Depth to Water Before Sampling: 9.68 ft
Sample Methodology: low flow peri pump
Sample Name: WBP - TTMW - 04 - 0319 QC Sample:
Sample Date/Time: 3/22/19 0950
Sampler / Signature: Lora Pndi
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: explosives and VOCs

flush mount

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-TTMW-05B	Site: IAAAP
Field Crew: Lina Pradi	Date: 3/23/19 Project #:

Well Depth (ft.): 5.89
DTW (ft.): ~~3.01~~ (TP) ~0.5 inches,
Water Column (ft.):
Well Diameter (in.):
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: peri pump

Water Quality Meter: C-102936

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

PID: 0.0 ppm

begin @ 1220

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500	~~.08~~	+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1224	1.22	75	~~.08~~ .08	7.04	8.1	0.84	129.1	3.7	15.3	
	1227	1.13	75		6.98	9.1	0.83	126.9	2.8	17.2	
	1230	1.47	75		6.99	7.3	0.83	125.6	2.8	16.9	
	1233	1.66	75		6.97	6.6	0.81	125.0	2.6	21.8	
	1235	1.79	75		6.96	6.6	0.80	124.6	2.8	13.5	
	1238	1.98	75		6.94	6.5	0.81	124.4	2.9	8.27	
	1241	2.06	60		6.93	6.7	0.81	124.2	2.7	11.3	
	1243	2.11	60		6.92	6.6	0.81	123.9	2.7	7.00	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @ 1243
samples collected @ 1247

SAMPLING

Depth to Water Before Sampling: 2.11 ft
Sample Methodology: low flow peri pump
Sample Name: WBP-TTMW-05B-03A QC Sample:
Sample Date/Time: 3/23/19 1247
Sampler / Signature: Lina Pradi
Filtered Metals Collected: Y (N) Filter Size:
Sample Observations:
Parameters: explosives and VOCS

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: ~~WBP-MW9~~ TT-MW06	Site: IAAAP
Field Crew: Justin Hansen	Date: 3/22/19 Project #:

Well Depth (ft.): 7.50
DTW (ft.): 4.90
Water Column (ft.): 2.60
Well Diameter (in.): 1
Gal. per ft.: 0.041
Well Volume (gal.): 0.2

Purge Methodology: Peristaltic

Water Quality Meter: YSI #C103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

1" = 0.041

Begin 1630

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1633	5.81	100	0.1	6.90	6.7	0.683	58.2	10.60	7.31	
	1636	6.37	100	0.2	6.72	6.4	0.681	87.1	8.22	5.42	
1641	~~1639~~	7.05	75	0.30	6.67	7.0	0.728	88.3	6.43	6.01	
	1644	7.39	75	0.4	6.65	7.1	0.781	91.2	6.31	21.7	
	1646	— Dry, Other piezometers recharged shortly - will give this one 10-15 minutes and see if sample can be collected.									
		— Only recharged 75 ml in 15 minutes. Will come back tomorrow.									
3/23/19	0945	5.20 sampled for explosives and RCRA metals									
3/24/19	0945	sampled for VOC									
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

PID: BZ=0.0ppm Headspace = 0.0ppm

SAMPLING

Depth to Water Before Sampling: —
Sample Methodology: PERI
Sample Name: WBP-TT-MW-06-0319 QC Sample: —
Sample Date/Time: 3/23 - 3/24
Sampler / Signature: LP
Filtered Metals Collected: Y / N (N circled) Filter Size:
Sample Observations: —
Parameters: EXPLOSIVES, VOCS, METALS

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-TTMW-08		Site: IAAAP	
Field Crew: Lora Prai		Date: 3/22/19	Project #:
Well Depth (ft.): 9.90 ft	Purge Methodology: low flow peri pump	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 5.74 ft			
Water Column (ft.):			
Well Diameter (in.): 2 in			
Gal. per ft.: .163	Water Quality Meter: C-102936		
Well Volume (gal.):			PID: 0.0 ppm

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	hydrocarbon smell
Initial	1307	6.62	100		7.38	8.2	0.457	845	8.8	22.8	
	1310	6.86	100		7.32	8.1	0.463	825	5.0	19.2	
	1313	7.12	100		7.30	8.1	0.463	82.6	4.7	19.8	
	1316	7.35	100		7.29	8.2	0.465	82.1	4.3	19.3	
	1319	7.55	75		7.29	8.4	0.472	81.4	4.2	19.3	
	1322	7.72	75		7.29	8.4	0.475	81.3	4.2	18.1	
	1325	7.81	60		7.28	8.9	0.481	81.8	4.1	20.6	
	1328	7.88	60		7.28	9.0	0.487	82.2	4.1	21.1	
	1331	7.99	60		7.29	9.1	0.497	82.5	4.1	18.7	
	1334	8.08	60		7.29	8.8	0.505	82.0	4.2	17.5	
	1337	8.11	60		7.30	9.5	0.508	81.8	4.2	18.4	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @ 1337
samples collected @ 1340

SAMPLING

Depth to Water Before Sampling: 8.11

Sample Methodology: low flow peri pump

Sample Name: WBP-TTMW-08-0319 QC Sample:

Sample Date/Time: 3/22/19

Sampler / Signature: Lora Prai

Filtered Metals Collected: Y / N Filter Size:

Sample Observations:

Parameters: explosives and VOCs

ch2m:

Pg 1 of 2

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-TTMW-10		Site: IAAAP	
Field Crew: Dora Prade		Date: 3/23/19	Project #:
Well Depth (ft.): 12.57	Purge Methodology: peri pump	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 3.58			
Water Column (ft.):			
Well Diameter (in.): 2in			
Gal. per ft.: .163	Water Quality Meter: C-102936		
Well Volume (gal.):			

started @ 1032

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1035	4.23	150		6.71	7.6	0.91	162.3	2.9	64.1	
	1038	4.73	125		6.65	7.8	0.91	160.8	1.7	34.2	
	1041	5.11	125		6.67	7.8	0.91	158.4	1.6	28.8	
	1044	5.57	125		6.72	7.8	0.91	154.0	1.4	23.0	
	1047	5.73	100		6.77	7.9	0.91	149.3	1.3	20.6	
	1050	5.98	100		6.79	7.9	0.91	146.1	1.2	14.6	
	1053	6.24	100		6.82	7.9	0.91	143.3	1.1	12.5	
	1055	6.39	75		6.83	8.1	0.91	140.5	1.2	10.7	
	1058	6.57	100		6.86	8.0	0.87	138.4	1.5	15.2	
	1101	6.64	100		6.86	8.0	0.83	137.1	1.9	19.6	
	1103	6.72	100		6.89	8.0	0.76	135.5	2.9	28.5	
Post-Purge	1105	6.81	100		6.89	8.0	0.707	134.5	3.2	31.4	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling: 7.13 ft

Sample Methodology: low flow peri pump

Sample Name: WBP-TTMW-10 QC Sample:

Sample Date/Time: 3/23/19 1120

Sampler / Signature: Dora Prade

Filtered Metals Collected: Y / N Filter Size:

Sample Observations:

Parameters: explosives and VOCs

ch2m:

Pg 2 of 2

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP - TTMW-10
Site: IAAAP
Field Crew: Ana Prado
Date: 3/23/15 Project #:

Well Depth (ft.): 12.57
DTW (ft.): 3.58
Water Column (ft.):
Well Diameter (in.): 2in
Gal. per ft.: .163
Well Volume (gal.):

Purge Methodology: peri pump

Water Quality Meter: C-102934

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

PID: 0.0 ppm

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1107	6.90	100		6.89	7.8	0.675	133.8	3.5	31.5	
	1110	~~6.90~~ 6.90	100		6.88	7.6	0.671	132.4	3.5	29.9	
	1113	7.10	100		6.87	7.7	0.678	131.0	3.5	31.5	
	1115	7.13	100		6.86	7.6	0.685	130.1	3.5	29.2	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @1115
samples collected @1120

SAMPLING

Depth to Water Before Sampling: 7.13 ft
Sample Methodology: low flow peri pump
Sample Name: WBP - TTMW-10 QC Sample:
Sample Date/Time: 3/23/15 1120
Sampler / Signature: Ana Prado
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: explosives and VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-TT-MW-11		Site: ~~3/22~~ (JP) IAAAP	
Field Crew: Lora Prdl		Date: 3/22/19	Project #:
Well Depth (ft.): 20.72	Purge Methodology: low flow peri pump	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 4.59			
Water Column (ft.):			
Well Diameter (in.): 2 in			
Gal. per ft.: .163	Water Quality Meter: C-102936		
Well Volume (gal.):			

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1650	4.99	160		6.85	9.9	2.46	119.3	3.8	9.19	
	1653	5.16	160		6.77	9.5	2.45	116.8	1.9	10.7	
	1656	5.21	160		6.75	9.3	2.46	116.0	1.6	11.0	
	1659	5.26	175		6.75	9.1	2.44	114.8	1.3	7.86	
	1702	5.29	175		6.75	9.0	2.45	114.1	1.1	10.4	
	1705	5.35	200		6.73	9.0	2.45	113.4	1.0	11.8	
	1708	5.38	200		6.74	8.7	2.44	112.6	0.9	11.1	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @ 1708
samples collected @ 1710

SAMPLING

Depth to Water Before Sampling: ~~TT.C~~ (JP) 5.38 ft
Sample Methodology: low flow peri pump
Sample Name: WBP-TT-MW-11-0319 QC Sample:
Sample Date/Time: ~~Lora Prdl~~ (JP) 3/22/19 1710
Sampler / Signature: Lora Prdl
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: explosives and VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-TTMW12	**Site:** WBP
Field Crew: Joshua Hansen	**Date:** 3/19/19 **Project #:**

Well Depth (ft.): 20.28
DTW (ft.): 12.92
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Peristaltic

Water Quality Meter: YSI #C103742

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1355

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1359	14.00	variable	0.5	7.00	10.9	1.18	172.7	2.36	1.08	
	1402	13.98	125	0.6	7.07	11.3	1.15	168.3	2.24	1.15	
	1405	14.04	125	0.7	7.09	11.2	1.12	163.7	2.29	1.20	
	1408	14.10	125	0.8	7.12	11.0	1.11	158.1	2.24	1.31	
	1411	14.15	125	0.9	7.13	11.1	1.11	156.0	2.20	1.09	
Post-Purge											

Remarks: Pump Intake Depth: 19 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 125 ml/min

SAMPLING

Depth to Water Before Sampling: 14.15
Sample Methodology: Peristaltic
Sample Name: WBP-TTMW-12-0319 QC Sample: —
Sample Date/Time: 3/19/19 1415
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations: Clear
Parameters: Explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-TTMW13		**Site:** WPP	
Field Crew: Joshua Hansen		**Date:** 3/19/19	**Project #:**

Well Depth (ft.): 16.80
DTW (ft.): 6.80
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Peristaltic

Water Quality Meter: YSI # C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1303

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1307	7.45	variable	0.5	7.13	8.8	0.699	166.3	2.95	3.52	
	1310	7.45	150	0.6	7.19	8.8	0.698	164.3	2.81	4.07	
	1313	7.48	150	0.8	7.16	8.6	0.687	162.3	2.58	3.21	
	1316	7.50	150	0.9	7.16	8.9	0.688	159.5	2.63	2.68	
	1319	7.52	150	1.0	7.16	8.5	0.690	159.6	2.53	2.94	
Post-Purge											

Remarks: Pump Intake Depth: 16 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 150 ml/min

SAMPLING

Depth to Water Before Sampling: 7.52
Sample Methodology: Peristaltic
Sample Name: WBP-TTMW-13-0319   QC Sample: —
Sample Date/Time: 3/19/19 1320
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N   Filter Size:
Sample Observations: Clear
Parameters: Explosives

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-TTMW14-		Site: WBP	
Field Crew: Jestin Hansen		Date: 3/19/19	Project #:
Well Depth (ft): ~~20-36~~ 18.33	Purge Methodology: Peristaltic		
DTW (ft.): 9.86			
Water Column (ft.):			
Well Diameter (in.): 2			
Gal. per ft.:			
Well Volume (gal.):	Water Quality Meter: YSI # C-103142		

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Initiate 1156

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1201	10.20	variable	0.2	6.89	9.9	1.09	205.2	5.79	22.3	Bubbles in line
	1205	10.38	100	0.3	6.89	9.8	1.22	200.1	4.47	1.52	
	1208	10.52	100	0.4	6.87	9.0	1.23	187.3	1.54	1.79	↑ flow to induce recharge
	1218	12.95	variable	1.2	6.88	9.0	1.26	162.7	1.01	1.16	
	1221	12.88	125	1.3	6.99	9.5	1.22	153.2	1.26	1.01	
	1224	12.90	125	1.4	6.98	9.6	1.22	153.0	1.29	0.97	
	1227	12.94	125	1.5	6.97	9.6	1.21	147.8	1.34	1.19	
Post-Purge											

Remarks: Pump Intake Depth: 18 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 125 ml/min

SAMPLING

Depth to Water Before Sampling: 12.94

Sample Methodology: Peristaltic

Sample Name: WBP-TTMW-14-0319 QC Sample: —

Sample Date/Time: 3/19/19 1230

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N (N circled) Filter Size:

Sample Observations: Clear

Parameters: Explosives, VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-~~MW~~ TTMW15		Site: WBP IAAAP	
Field Crew: JH J.Hansen		Date: 3/9/19	Project #:

Well Depth (ft.): ~~16.00~~ 25.48
DTW (ft.): 14.32
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Peristaltic

Water Quality Meter: #C-103142 YSI Pro

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Start 1553

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1558	15.98	variable	0.5	6.87	10.0	0.86	184.0	6.55	5.96	
	1602	15.96	250	0.7	6.85	9.8	1.13	183.9	6.37	6.33	
	1605	15.95	250	0.9	6.86	9.9	1.13	184.3	6.04	3.11	
	1608	15.95	250	1.1	6.87	9.9	1.13	184.0	6.02	3.33	
	1611	15.94	250	1.3	6.87	9.8	1.13	183.8	5.99	4.19	
Post-Purge											

Remarks: Pump Intake Depth: 23 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 250 ml/min

SAMPLING

Depth to Water Before Sampling: 15.94
Sample Methodology: Peristaltic
Sample Name: WBP-TTMW15-0319 QC Sample: —
Sample Date/Time: 3/9/19 1615
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations:
Parameters: Explosives

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-68		Site: West Burn PAD, IAAP	
Field Crew:		Date: 12-19-19	Project #:

Well Depth (ft.):		Purge Methodology:
DTW (ft.):	13.92	
Water Column (ft.):		
Well Diameter (in.):	2"	
Gal. per ft.:	0.163	Water Quality Meter:
Well Volume (gal.):		

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1102	14.03	200	0.1	6.86	10.48	0.695	52.5	7.29	327	Lt. gray
	1107	14.51	200	0.3	6.80	10.57	0.684	56.4	7.84	112	
	1112	14.88	200	0.5	6.78	10.54	0.683	63.8	8.06	34.9	
	1117	15.18	200	0.8	6.76	11.03	0.674	70.1	8.13	18.2	Clear
	1122	15.59	200	1.0	6.76	10.52	0.674	74.3	8.14	9.81	
	1127	15.83	200	1.3	6.74	10.27	0.673	78.6	8.13	9.17	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

Dry At 3.5 liters

SAMPLING

Depth to Water Before Sampling:	16'		
Sample Methodology:	Parislaltic Low Flow		FD01
Sample Name:	WBP-JAW-68-1219	QC Sample:	WBP-~~JAW~~-68-1219
Sample Date/Time:	12-19-19 1130		1200
Sampler / Signature:	[illegible]		
Filtered Metals Collected:	Y / N	Filter Size:	
Sample Observations:	Clear And stable		
Parameters:	Explosives & VOC		

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-MW6
Field Crew: Spies
Well Depth (ft.): 41.90
DTW (ft.): 27.22
Water Column (ft.): 14.68
Well Diameter (in.): 2
Gal. per ft.: .163
Well Volume (gal.): 2.39 gal

Purge Methodology: low flow

Water Quality Meter: YSI pro plus

Site: IAAAP
Date: 5-6-20
Project #:

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1530	27.22	200	—	7.34	14.4	0.692	68.3	6.29	ovr	Milky grey/white, opaque, suspended sed, no odor
	1535	29.02	300		7.14	13.6	0.680	1.8	0.74	over	SAA
	1540	30.84	350		7.16	13.0	0.681	-9.3	0.49	over	SAA
	1545	33.18	350		7.17	12.7	0.682	12.8	0.40	over	SAA
	1550	34.06	200		7.18	12.9	0.681	30.7	0.46	over	SAA
	1555	34.89	300		7.17	13.0	0.680	33.3	0.47	867	SAA
	1600	36.32	350		7.15	12.9	0.684	29.7	0.36	705	SAA
	1605	37.43	300		7.14	12.7	0.672	20.8	0.35	over	SAA
	1610	38.92	300		7.17	12.9	0.682	14.8	0.34	over	SAA
	1615	40.17	300	4.0	7.17	13.0	0.678	17.2	0.33	over	SAA
	Well dry @ 1618										
Post-Purge											

Remarks: Pump Intake Depth: 41 ft

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min)

Allow well to recharge before sampling.

seepage 2

SAMPLING

Depth to Water Before Sampling:
Sample Methodology:
Sample Name: See pg 2
Sample Date/Time:
Sampler / Signature:
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters:

QC Sample: MS/MSD & FD

ch2m.

Pg 2 of 2

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: WBP-MW6		Site: IAAAP	
Field Crew: Spies		Date: 5-7-20	Project #:
Well Depth (ft.): 41.90	Purge Methodology: low flow		
DTW (ft.) 28.49			
Water Column (ft.): 13.41			
Well Diameter (in.): 2			
Gal. per ft.: .163	Water Quality Meter: YSI proplus		
Well Volume (gal.): 2.19			

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	905	28.49	200	—	7.30	12.2	0.651	45.6	3.62	Over	Milky grey/white, opaque Suspended Sed, No odor
		—	Collect	Sample	@		910	—	—		
Post-Purge											

Remarks: Pump Intake Depth: 41 ft Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

All Samples Collected are turbid

SAMPLING

Depth to Water Before Sampling: 28.49

Sample Methodology: low flow

Sample Name: WBP-mw6-0520 QC Sample: MS/MSD & FD

Sample Date/Time: 5-7-20 / 910

Sampler / Signature: J. Spies J Spies

Filtered Metals Collected: Y / N Filter Size: —

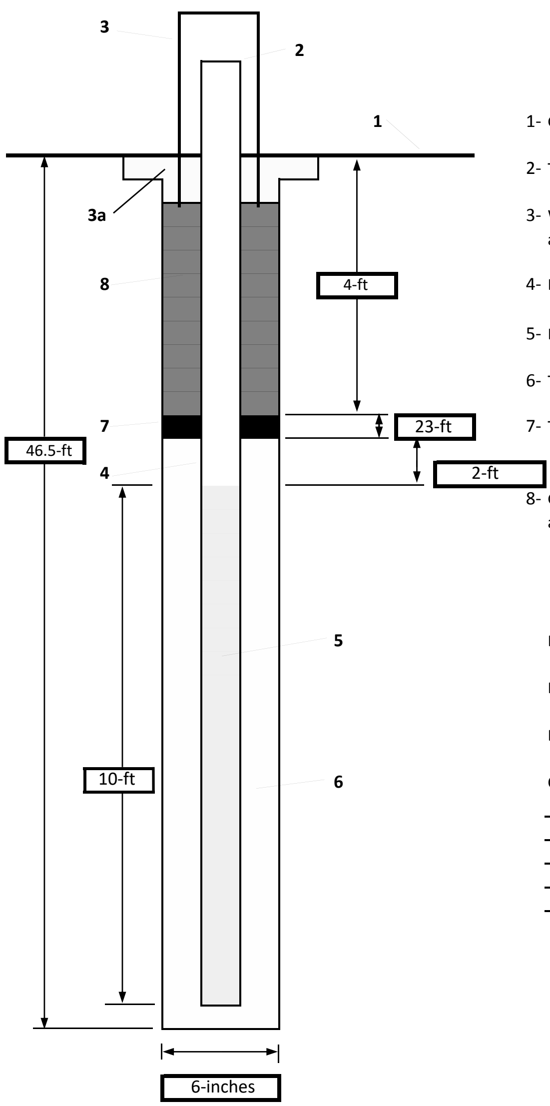
Sample Observations: Turbid

Parameters: Stable

PROJECT NUMBER	WELL NUMBER	
679172CH	WBP-MW6	SHEET 1 OF 1

WELL CONSTRUCTION DIAGRAM

PROJECT : Iowa Army Ammunition Plant RI Investigation   Location: West Burn Pads
PROJECT MANAGER: J. Morrison
DRILLING CONTRACTOR : Cascade
DRILLING METHOD AND EQUIPMENT USED : MiniSonic 6" Rods
WATER LEVELS : NA   START DATE/TIME: 7/25/2018 at 08:40   END DATE/TIME: 7/25/2018 at 10:30



Well Construction Details

1- Ground elevation at well: NM
2- Top of casing elevation: NM
3- Wellhead protection cover type: Stickup
a) concrete pad dimensions:
4- Length (ft) & dia. (in) of well casing: 2-inch Schedule 40 PVC
5- Length (ft) & slot size (in) of screen: 0.010-inch Slotted Screen
6- Type screen filter & quantity used: FilterSil, 6 50-lb bags
7- Type of seal & quantity used: HolePlug, 50 lbs
8- Grout
a) Grout mix used:

Well Development Details

Development method: NA
Development time: NA
Estimated purge volume: NA
Comments: Centralizers at 28' and 39' bgs

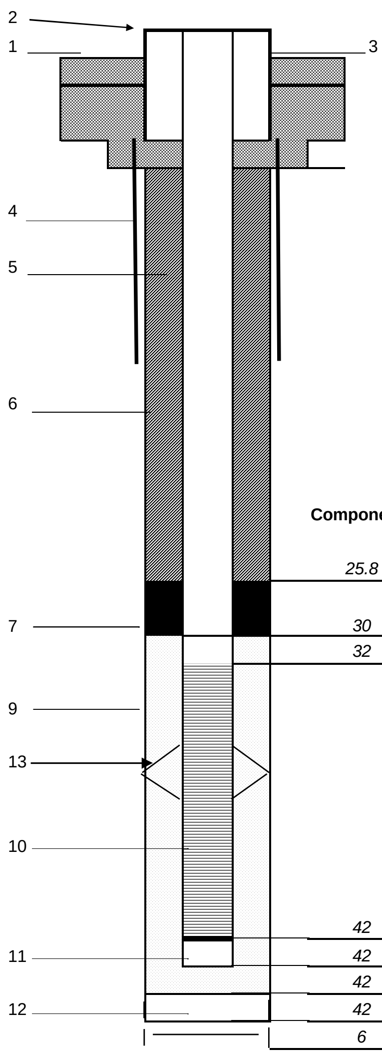
LOGGED BY: SIGNATURE: DATE: 7-25-2018
DEVELOPED BY: SIGNATURE: DATE:
CHECKED BY: SIGNATURE: DATE:

ch2m

PROJECT NUMBER	WELL NUMBER
679172CH	**WBP-MW8**

WELL COMPLETION DIAGRAM

PROJECT NAME :	*IAAAP RI*	LOCATION NAME:	*West Burn Pad*
NORTHING:	*301642.997* EASTING: *2276256.38*	DRILLING CONTRACTOR:	*Cascade*
START DATE:	*07-31-2018* END DATE: *07-31-2018*	DRILLING METHOD:	*Rotosonic*
BOREHOLE DIAMETER:	*6* inches	DRILLING EQUIPMENT:	*Minisonic*
TOTAL BOREHOLE DEPTH:	*42* feet bgs	LOGGED BY:	*Micheal Tekle*



Component Depths BGS

25.8	Top of transition seal (feet bgs)
30	Top of filter pack (feet bgs)
32	Top of screen (feet bgs)
42	Bottom of screen (feet bgs)
42	Bottom of sump (feet bgs)
42	Bottom of filter pack (feet bgs)
42	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*664.586*	feet msl
2- Top of casing elevation	*667.331*	feet msl
3- Surface completion type	*Steel protective casing (stick-up)*	
a) Protective casing dimensions	*NA*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	*-*	inches
b) Length	*-*	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*33*	feet (including stick-up)
6- Sanitary seal type	*Bentonite cement grout mix*	
a) Method of placement	*Pump*	
b) Volume used	*40*	gallons
c) Calculated volume	*-* feet^3 *-*	gallons
7- Transition seal type	*Bentonite chips (3/8")*	
a) Quantity used	*1*	50 lb bags
b) Calculated quantity	*-* feet^3 *-*	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	*-*	50 lb bags
b) Calculated quantity	*-* feet^3 *-*	50 lb bags
9- Filter pack type	*Filter sand*	
a) Quantity used	*3.5*	50 lb bags
b) Calculated quantity	*-* feet^3 *-*	50 lb bags
10- Screen type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*Schedule 40 PVC end cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	*-*	
b) Calculated quantity	*-* feet^3	
13- Centralizer type	*None*	
a) Depths	*-*	feet bgs

Well Development

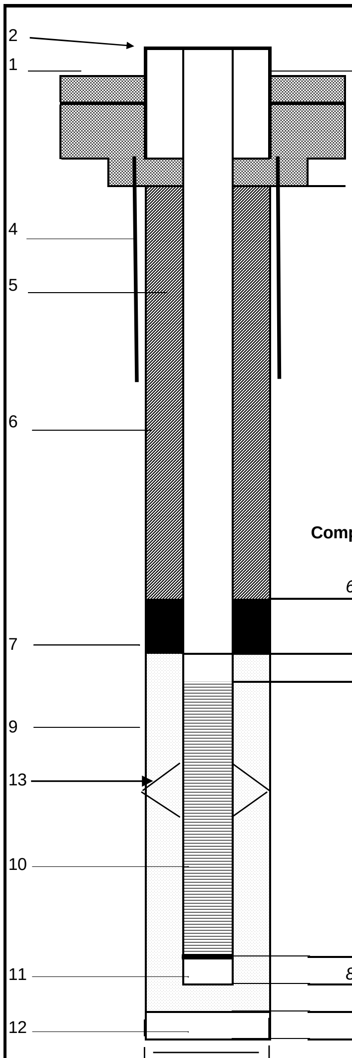
Start Date/Time:	*07-2018 / 15:20*	
End Date/Time:	*07-2018 / 16:00*	
Measured Depth to Water	*34.02*	feet btoc
Development Method:	*Monsoon pump*	
Duration:	*0.67*	hours
Purge volume:	*30*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*1.37*	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Well purged dry during development

	PROJECT NUMBER	WELL NUMBER
	679172CH	**WBP-MW9**
	WELL COMPLETION DIAGRAM	

OJECT NAME :	*IAAAP RI*			LOCATION NAME:	*West Burn Pad*
RTHING:	*301715.584*	EASTING:	*2276209.938*	DRILLING CONTRACTOR:	*Cascade*
ART DATE:	*08-01-2018*	END DATE:	*08-02-2018*	DRILLING METHOD:	*Rotosonic*
REHOLE DIAMETER:	*6* inches			DRILLING EQUIPMENT:	*Minisonic*
TAL BOREHOLE DEPTH:	*82* feet bgs			LOGGED BY:	*Micheal Tekle*



Component Depths BGS

62.5	Top of transition seal (feet bgs)
68	Top of filter pack (feet bgs)
70	Top of screen (feet bgs)
80	Bottom of screen (feet bgs)
80.5	Bottom of sump (feet bgs)
82	Bottom of filter pack (feet bgs)
82	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*655.758*	feet msl
2- Top of casing elevation	*658.404*	feet msl
3- Surface completion type	*Steel protective casing*	
a) Protective casing dimensions	*NA*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	*-*	inches
b) Length	*-*	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*74.5*	feet (including stick-up)
6- Sanitary seal type	*Grout*	
a) Method of placement	*NA*	
b) Volume used	*NA*	gallons
c) Calculated volume	*-* feet^3 -	gallons
7- Transition seal type	*Bentonite chips (3/8")*	
a) Quantity used	*1*	50 lb bags
b) Calculated quantity	*-* feet^3 -	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	*-*	50 lb bags
b) Calculated quantity	*-* feet^3 -	50 lb bags
9- Filter pack type	*Filter sand*	
a) Quantity used	*4.5*	50 lb bags
b) Calculated quantity	*-* feet^3 -	50 lb bags
10- Screen type	*V-wire*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*End cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	*-*	
b) Calculated quantity	*-* feet^3	
13- Centralizer type	*NA*	
a) Depths	*68 and 80*	feet bgs

Well Development

Start Date/Time:	*See Well Development Log*
End Date/Time:	
Measured Depth to Water	feet btoc
Development Method:	
Duration:	hours
Purge volume:	gallons
Volume of water injected:	gallons
Calculated casing volume:	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

ch2m

PROJECT NUMBER	WELL NUMBER	
679172	WBP-MW6	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT : USACE IAAAP
LOCATION : WBP-MW6
DEVELOPMENT CONTRACTOR : Cascade
LOGGER : T. Quallo
DEVELOPMENT METHOD AND EQUIPMENT USED : MONSOON
START : 1420 } surge
END : 1442 } surge 1510 - end development

START WATER LEVELS : 30.58
WELL DEPTH: 42.18
WELL VOLUME: 1.89
MAXIMUM DRAWDOWN DURING DEVELOPMENT: 11.6 - purged dry
TOTAL QUANTITY OF WATER DISCHARGED: 6 gallons
DISPOSITION OF DISCHARGE WATER: gray silty color

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1420		30.58					surge - start
1442		30.58					surge - stop
1445	6 gallons	37.13					
1455	—	—	—	—	—	—	purged dry
1505	—	39.77	—	—	—	—	
1507	—	39.50	—	—	—	—	
1509	—	39.45	—	—	—	—	

PROJECT NUMBER 679172

WELL NUMBER WBP-MW8

SHEET 1 OF 1

ch2m

WELL DEVELOPMENT LOG

PROJECT : USACE IAAAP

LOCATION : WBP-MW8

LOGGER : J. Ovalio

DEVELOPMENT CONTRACTOR : Cascade

DEVELOPMENT METHOD AND EQUIPMENT USED : Monsoon

START : 1528

END : 1608

START WATER LEVELS : 34.02

WELL DEPTH: 42.46

WELL VOLUME: 1.37

MAXIMUM DRAWDOWN DURING DEVELOPMENT: 8.44 purged dry

TOTAL QUANTITY OF WATER DISCHARGED: 30 gallons

DISPOSITION OF DISCHARGE WATER: gray silt color

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1530	—	34.02	—	—	—	—	Surge-Start
1535	—	↓	—	—	—	—	Surge-Stop
1540	—	35.92	—	—	—	—	purge
1545	—	35.62	—	—	—	—	
1555	10 gallons	35.50	—	—	—	—	
1600	10 gallon	—	—	—	—	—	dry
1608	10 gallons	—	—	—	—	—	

ch2m

PROJECT NUMBER	WELL NUMBER	
679172	WBP-MW9	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT : RAAAP
DEVELOPMENT CONTRACTOR : Cascade
DEVELOPMENT METHOD AND EQUIPMENT USED : Pump, tank
START :
END :
LOCATION : WBP
LOGGER : LMartin

START WATER LEVELS : 14.28' btoc
WELL DEPTH: 81.58' btoc
WELL VOLUME: ~~8~~ 10.97 gallons
MAXIMUM DRAWDOWN DURING DEVELOPMENT: 72.78'
TOTAL QUANTITY OF WATER DISCHARGED: 30 gallons.
DISPOSITION OF DISCHARGE WATER: clear

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1450	~~72.78~~	72.78'	—	13.67	8.37	0.551	clear
1455	Pull pump - it was caught at .75' bgs.						
~~1500~~ LHM							
1508	Start pump again.						
1520	26	69.20'	—	14.44	8.26	0.578	clear.
1525	28	69.56'	—	14.08	7.46	0.571	clear
1530	30	69.14	—	14.50	7.33	0.565	
1535							

water level fluctuates up and down. well is recharging

SOP-16_Well Development Form

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID NBP-MW1

Sheet 1 of 1

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** North Burn Pads
Weather: Sunny, 70 degrees F **Drilling Contractor:** Dakota
Drilling Method and Equipment Used: Geoprobe 6620 DT 2" Macrocore, 5' long
Water Level: 19' bgs **Start Date & Time:** 6/7/2018 at 08:30 **End Date & Time:** 6/7/2018 at 08:50 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
5	0-5	4.5	DPT1	CL	0 - 5' - **CL**: Lean clay, moist, black (5YR 2/1) and brown (10YR 4/3), stiff, trace gravel and sand	- 0.0 ppm - 0.0 ppm - 0.0 ppm
10	5-10	5.0	DPT2	CL	5 - 7' - **CL**: Same as above 7 - 9.5' - **CL**: Sandy clay, brown (10YR 4/3) and gray (7.5YR 5/1), gray, moist, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm
15	10-15	5.0	DPT3	CL-CH	10 - 15' - **CL - CH**: Lean to fat clay, gray (7.5YR 5/1), mottled black and orange, moist, stiff, trace sand and gravel	- 0.0 ppm - 0.0 ppm - 0.0 ppm
20	15-20	5.0	DPT4	CL SW	15 - 19' - **CL**: Same as above 19 - 20' - **SW**: Fine sand with little silt, wet, light brownish gray (10YR 6/2), dense	- 0.0 ppm - 0.0 ppm Water at 19' bgs - 0.0 ppm
25	20-25	4.0	DPT5	SW CL	20 - 23.5' - **SW**: Same as 19 - 20' 23.5 - 24' - **CL**: Sandy clay as 7 - 9.5', wet, soft	- 0.0 ppm - 0.0 ppm - 0.0 ppm
30					End of boring at 25' bgs	

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-11	Site: IAAAP NBP
Field Crew: Justin Hansen	Date: 3/24/19 Project #:

Well Depth (ft.): 31.56
DTW (ft.): 8.33
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Peristaltic

WL Meter # C103372
Water Quality Meter: YSI # C103142
Turbidimeter # C103314

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1057

Field Parameters

	Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1102	10.65	400	0.5	7.30	10.3	0.84	187.7	6.34	17.0	
	1105	11.10	200	0.75	7.29	9.7	0.85	187.4	5.70	13.2	
	1108	11.13	200	0.9	7.29	9.8	0.84	187.1	5.40	9.71	
	1111	11.20	200	1.1	7.26	9.9	0.84	185.8	5.04	10.1	
	1114	11.22	200	1.2	7.28	9.9	0.84	185.4	4.96	9.83	
	1117	11.28	200	1.5	7.28	10.0	0.84	185.1	4.88	9.04	
Post-Purge											

Remarks:

Pump Intake Depth: 30 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 200 ml/min

SAMPLING Complete 1150

Depth to Water Before Sampling: 11.28
Sample Methodology: Peristaltic
Sample Name: JAW-11-0319 QC Sample: MS/MSD
Sample Date/Time: 3/24/19 1120
Sampler / Signature: [signature]
Filtered Metals Collected Y / N Filter Size:
Sample Observations: Clear
Parameters: Explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-12	Site: JAAAP NBP
Field Crew: Lora Prade	Date: 3/24/15 Project #:
Well Depth (ft.): 24.09 ft	Purge Methodology: low-flow peri pump C-102741
DTW (ft.): 18.96 ft	
Water Column (ft.): 5.13 ft	
Well Diameter (in.): 2 in	
Gal. per ft.: .163	Water Quality Meter: C-102936
Well Volume (gal.): 20.99	

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

started @1215

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500	.1	+/- 0.1		SP +/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1218	19.13	200	.2	7.6	10.9	0.238	120.9	4.6	14.0	
	1221	19.22	200	.3	7.53	10.9	0.233	122.0	4.5	9.83	
	1224	19.38	200	.4	7.49	10.8	0.228	122.0	3.9	8.86	
	1227	19.60	200	.5	7.45	10.8	0.220	122.9	3.5	8.63	
	1230	19.91	200	.6	7.41	10.7	0.215	123.1	3.5	7.58	
	1233	20.26	200	.7	7.39	10.8	0.228	124.0	3.6	8.30	
	1235	—	200	.8	7.36	10.8	0.234	125.3	4.0	11.9	
	1238	20.78	200	.9	7.36	10.8	0.243	126.2	4.0	8.98	
	1241	20.91	200	1.0	7.40	10.9	0.249	126.1	3.9	5.72	
	1244	21.07	200	1.1	7.55	10.9	0.259	123.1	4.1	4.50	
	1247	21.22	200	1.2	7.59	11.0	0.263	121.9	3.7	5.78	
Post-Purge	1250	21.37	200	1.3	7.58	11.1	0.263	121.9	4.0	—	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @1250
samples collected @1255

PID C-102586
turbidity C-103190

SAMPLING

Depth to Water Before Sampling:
Sample Methodology: low flow peri pump
Sample Name: JAW-12-0319 QC Sample: —
Sample Date/Time: 3/24/19
Sampler / Signature: Lora Prade
Filtered Metals Collected: Y (N) Filter Size:
Sample Observations:
Parameters: explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-13		Site: IAAAP	
Field Crew: Lora Prai		Date: 3/24/19	Project #:
Well Depth (ft.): 19.91 ft	Purge Methodology: peri pump C-102471	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 15.8 ft			
Water Column (ft.): 4.11 ft			
Well Diameter (in.): 2 in			
Gal. per ft.: .163	Water Quality Meter: C-102936		
Well Volume (gal.): 17.33		PID: 0.0 ppm C-102586	

started @1110

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500	.1	+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1113	15.82	200	.2	7.27	10.1	0.651	127.9	3.8	12.3	
	1115	15.89	200	.3	7.22	9.9	0.556	128.8	4.0	13.1	
	1118	15.98	200	.4	7.18	9.8	0.538	130.4	4.2	9.75	
	1121	16.06	200	.5	7.18	9.8	0.534	129.5	4.0	10.0	
	1124	16.15	200	.6	7.21	9.8	0.532	127.9	4.3	6.99	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @1124
Samples Collected @1125

turbidity C-103190

SAMPLING

Depth to Water Before Sampling: 16.15

Sample Methodology: low flow peri pump

Sample Name: JAW-13-0319 QC Sample:

Sample Date/Time: 03/24/19 1125

Sampler / Signature: Lora Prde

Filtered Metals Collected: Y / (N) Filter Size:

Sample Observations:

Parameters: VOCs and explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-14
Field Crew: Dora Prodi
Site: IAAAP NBP
Date: 3/24/19
Project #:

Well Depth (ft.): 31.01 ft
DTW (ft.): 16.87 ft
Water Column (ft.): 14.14 ft
Well Diameter (in.): 2in
Gal. per ft.: .163
Well Volume (gal.): 28.26 ft

Purge Methodology: peri pump C-102741

Water Quality Meter: C-102936

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

started @1345

Field Parameters

	Time	DTW (ft)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500	.1	+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1348	17.24	200	.2	7.26	10.9	0.80	133.4	3.0	28.0	
	1351	17.83	200	.3	7.24	11.0	0.80	130.3	2.8	23.7	
	1354	18.32	200	.4	7.22	10.9	0.81	128.8	2.6	20.7	
	1357	18.87	200	.5	7.22	10.9	0.81	127.7	2.5	22.9	
	1400	19.51	200	.6	7.22	10.9	0.81	126.5	2.3	18.7	
	1403	20.17	200	.7	7.22	10.8	0.81	125.5	2.3	17.3	
	1406	20.61	200	.8	7.22	10.8	0.81	124.8	2.3	15.7	
	1409	21.16	200	.9	7.22	10.7	0.81	124.3	2.5	15.8	
	1412	21.41	200	1.0	7.22	10.7	~~0.59~~ 0.81	123.8	2.5	15.4	
	1415	21.41	200	1.1	7.22	10.7	0.81	123.4	2.4	14.5	
	1418	21.42	200	1.2	7.21	10.7	0.81	123.2	2.2	13.5	
Post-Purge	1421	21.49	200	1.3	7.21	10.7	0.81	122.3	2.3	12.3	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

1424	21.57	200	1.4	7.20	10.8	0.82	119.1	2.1	12.7

parameters stable @1424
samples collected @1426

turbidity C-103190

SAMPLING

Depth to Water Before Sampling: 21.57 ft
Sample Methodology: peri pump
Sample Name: JAW-14-0319
QC Sample:
Sample Date/Time: 3/24/19 1426
Sampler / Signature: Dora Prodi
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: explosives

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: NBP-MW1

Field Crew: Jestin Hunter

Site: NBP

Date: 3/24/19

Project #:

Well Depth (ft.): 27.7

DTW (ft.): 7.10

Water Column (ft.): 20.6

Well Diameter (in.): 2

Gal. per ft.: 0.163

Well Volume (gal.): 3.4

Purge Methodology: Peristaltic

Water Quality Meter: YSI #C103140 Turbidmeter # C103314

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

0937 Begin

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0942	10.13	variable	0.5	7.23	9.7	0.710	112.7	3.45	41.1	
	1002	14.35	250	1.75	7.20	9.1	1.22	207.5	5.06	35.7	
	1005	14.52	200	1.9	7.20	9.1	1.20	204.1	4.52	24.7	↑ Flow rate to 400 ml/min
	1012	18.01	100	2.75	7.20	9.2	1.20	201.6	4.36	21.8	
	1015	18.17	100	2.85	7.20	9.2	1.20	200.3	4.38	20.3	↑ Flow rate
	1018	18.25	200	3.1	7.19	9.4	1.19	199.3	4.48	20.2	
	1021	18.21	200	3.25	7.19	9.5	1.18	197.6	4.38	19.8	
Post-Purge											

Remarks:

Pump Intake Depth: 25.5 ft

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 200 ml/min

*0944 * YSI malfunctioned. Drawing down until recharge noted while waiting for replacement YSI reader to attach to probes

SAMPLING

Depth to Water Before Sampling: 18.21

Sample Methodology: Peristaltic

Sample Name: NBP-MW1-0319

QC Sample: —

Sample Date/Time: 3/24/19 1025

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N (N circled) Filter Size: —

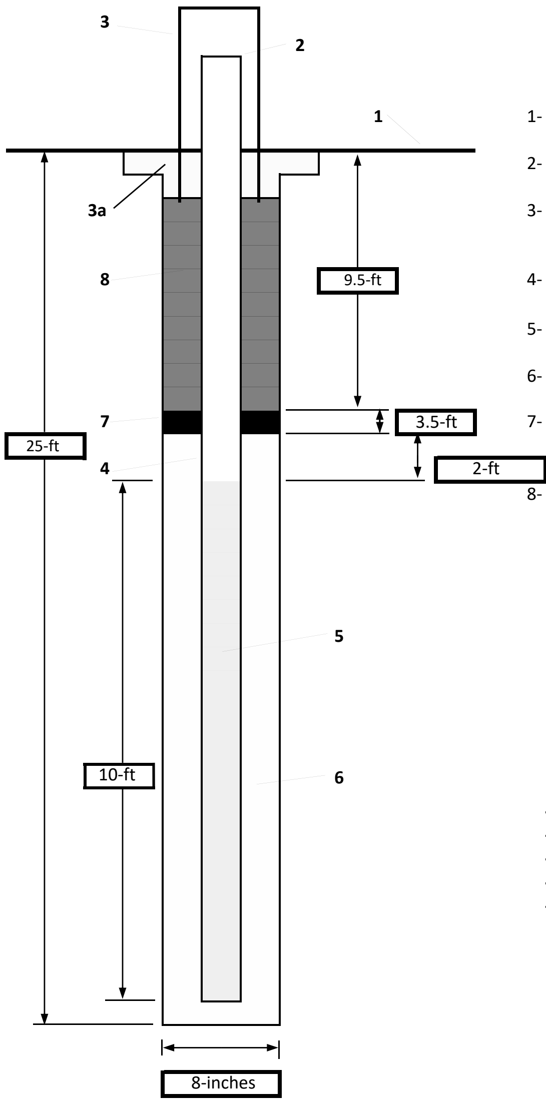
Sample Observations: Clear

Parameters: Explosives

PROJECT NUMBER	WELL NUMBER
679172CH	NBP-MW1 SHEET 1 OF 1

WELL CONSTRUCTION DIAGRAM

PROJECT : Iowa Army Ammunition Plant RI Investigation Location: North Burn Pads
PROJECT MANAGER: J. Morrison
DRILLING CONTRACTOR : Dakota
DRILLING METHOD AND EQUIPMENT USED : Geoprobe, 4.25" ID Augers
WATER LEVELS : NA START DATE/TIME: 6/7/2018 at 09:50 END DATE/TIME: 6/7/2018 at 11:20



Well Construction Details

1- Ground elevation at well	NM
2- Top of casing elevation	NM
3- Wellhead protection cover type	
a) concrete pad dimensions	
4- Length (ft) & dia. (in) of well casing	2-inch Schedule 40 PVC
5- Length (ft) & slot size (in) of screen	0.010-inch Slotted Screen
6- Type screen filter & quantity used	Premier Silica, 7.5 bags
7- Type of seal & quantity used	Bentonite Plug, 1.5 bags
8- Grout	
a) Grout mix used	Grout-well DF, 24 gallons

Well Development Details

Development method	NA
Development time	NA
Estimated purge volume	NA
Comments	

LOGGED BY: SIGNATURE: DATE: 6-7-2018

DEVELOPED BY: SIGNATURE: DATE:

CHECKED BY: SIGNATURE: DATE:

Development
3 Well Volume Groundwater Sampling: Field Data Sheet

Well Number: NBP-MW01	**Site:** IAAAP NBP
Field Crew: L. Martin	**Date:** 6-22-18 **Project #:** 679172

Well Depth (ft.): 25.16' bgs
DTW (ft.): 17.93' bgs
Water Column (ft.):
Well Diameter (in.):
Gal. per ft.:
Well Volume (gal.):

Purge Equipment: Peristaltic

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Weather:

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Cond. (mS/cm)	Turbidity (NTU)	D.O. [Surface] (mg/l)	Temp (C)	ORP (mV)	Turbidity (Lamotte 2020) (NTU)	Color/Odor
	Stabilization				+/- 0.1	+/- 3 %	+/- 10%	+/- 10 mV		+/- 10%	+/- 10%	
Initial	1605	20.08		2	7.51	0.608	++++	11.37	11.4	150.2		cloudy
Vol. 1	1610	20.84		2.5	7.44	0.599	####	8.37	11.1	148.6		"
Vol. 2	~~1615~~											
Vol. 3	1620	22.48		3.0	7.32	0.571	####	8.41	11.0	146.8		"
	1625	23.68		4.5	7.30	0.566	####	7.98	11.0	148.6		"
	1630	24.30		5.0	7.34	0.575	++++	8.19	11.1	150.7		"
	1635	Begins running dry, then goes dry by 1636										
	1640			5.5 gallons purged								
	1642	turned pump back on and purged 0.5 gallons										

Remarks: Pump Intake Depth: Bottom   Control Box Setting:

Final Purge Amount: 6.0 gallons

Intial PID Reading:

SAMPLING

Depth to Water Before Sampling:
Sample Methodology:
Sample ID: QC Sample:
Sample Date/Time:
Sampler / Signature:
Filtered Metals Collected: Y / N   Filter Size:
Sample Observations:
Analyses:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID **NBPLF-MW2**

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF

Weather: N/A **Drilling Contractor:** Dakota

Drilling Method and Equipment Used: Geoprobe 6620 DT

Water Level: **Start Date & Time:** 7/11/18 at 15:52 **End Date & Time:** 7/11/18 at 16:40 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	**Soil Description** USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	**Comments** Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
0–5	0-5	4.2	DP1	CL	0 - 4.2' - **CL**: lean clay, trace gravel and sand, strong brown, (7.5Y 4/6), mottled black, dry, stiff 4.2 - 5' - No recovery	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
5–10	5-10	5.0	DP2	CL	5 - 20' - **CL**: lean clay, trace gravel and sand, strong brown, (7.5Y 4/6), mottled black, dry, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
10–15	10-15	5.0	DP3			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
15–20	15-20	5.0	DP4			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
20–25	20-25	5.0	DP5	CL	20 - 27' - **CL**: lean clay, trace gravel and 10-30% sand, strong brown, (7.5Y 4/6), mottled black, dry, very stiff to hard	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
25–30	25-30		DP6		End of boring at 27' bgs	- 0.0 ppm - 0.0 ppm Piezometer installed O2 - 2.3% CO - 177 H2O - 2.0 ppm LEL - 0% VOCs - 0.0 ppm

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID

NBPLF-MW3

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork | **Site Location:** NBPLF
Weather: | **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic HQ Wireline | **Orientation:** Vertical
Water Level: | **Start Date & Time:** 7/18/18 at 08:20 | **End Date & Time:** 7/18/18 at 14:02 | **Logged By:** L. Martin

Feet BGS	Core Run Length and Recovery (%)	Discontinuous: RQD (%)	Fractures per Foot	Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
0–5						0 - 28' - Soil 28' begins, weathered bedrock, Sonic drilling in overburden Start 08:20 End 08:45 Driller: no sand encountered in overburden Drill through weathered bedrock Start 09:45 End 09:49 Surface casing set at 29' bgs
10						
15						
20						
25						
29				29' - 29.5' - Fracture zone, Rough/Undulating clay, partially washed out, coating fractures 29.75' Joint Rough and Planar	29' - 31' - **SHALEY LIMESTONE**, light olive gray (5Y 6/P), fine to medium grained, extremely fractured to sound, laminated to thin bedding, fresh to discolored, unweathered to slightly weathered, very weak to strong - continued next page	
30	R1 13%	75%	10+	27.5' - 29.5' Fractures/Joints, orientation 0 degrees, Rough/Undulating		R1: 13:32 - 13:50 Used 75 gallons of water, no loss or gain

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **NBPLF-MW3**	Sheet 2 of 3

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF
Weather: **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Mini Sonic HQ Wireline
Water Level: **Start Date & Time:** 7/18/18 at 08:20 **End Date & Time:** 7/18/18 at 14:02 **Logged By:** L. Martin

Feet BGS	Core Run Length and Recovery (%)	RQD (%)	Fractures per Foot	Discontinuous – Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	R1 13%	75%	2	30.6', 30.8' Mechanical breaks. No evidence of discoloration in fractures	See Page 1 (29' - 31') - closed discontinuities **SHALE** bedding and **LIMESTONE** interbedded. Strong HC1 reaction in **LIMESTONE**, **SHALE** - no reaction	
35	R2 100%	61%	3 3 3 2 3	31' - 31.8' Decomposed Shale, clay like, very soft to very stiff clay 31.9', 32.0' bedding planes, fracture orientation 30 and 45 degrees, Rough/Undulating 32.4', 32.8', 32.9' bedding planes, fracture orientation 0 degrees, Rough/Planar 33.1' Fracture orientation 0 degrees, Rough/Undulating 33.3' - 33.5' Fracture orientation 45 degrees, Smooth/Undulating 33.6', 33.7' Fracture orientation 0 degrees, Rough/Undulating 34.8', 35.4' Fracture orientation 0 degrees, Smooth/Undulating 35.5' - 35.8' Fracture orientation 60 degrees, Rough/Undulating	31' - 36' Interbedded **SHALE** and **LIMESTONE** **SHALE**, medium dark gray (N4), fine grained, extremely closed discontinuities, laminate bedding, decomposed to fresh, extremely weak to firm; **LIMESTONE** light gray (N6), laminate to thin bedding, extremely close to close discontinuities, fresh, unweathered, medium strong, slightly fractured to extremely fractured **SHALE** and **LIMESTONE**	R2: 16:13 - 16:20 at 31.75' bgs stopped to fix hydraulic line, No spill 16:22 16:53 Water color change at 32'-32.5' (gray) Water loss at 34.2' - 34.5' and 34.9' - 35.1' 190 gallons 70% return
40	R3 100%	45%	2 0 2 4 7	36.1', 36.2' bedding plane, fracture orientation 0 degrees, Smooth and Planar, on Shale/Limestone 38.5', 38.8', 39.0' Fracture orientation 0 degrees, Rough/Undulating 39.8', 39.9', Fracture orientation 20 degrees, Rough/Undulating 39.9' - 40.1' Fracture orientation 0 degrees, Rough/Undulating 40.1', 40.3', 40.5' Fracture orientation 0 degrees, Rough/Undulating 40.8', 41.5', 42.4', 42.8' Fracture orientation 0 degrees, Smooth and Planar	36' - 40' same as above, no reaction HC1 with **SHALE.** Strong reaction HC1 in **LIMESTONE**	Finished at 36' on 7/17/18 Water level at 8 a.m. on 7/18/18 WL = 29.8' bgs
45	R4 100%	88%	1 2 3 0 1	43.3', 43.4', 43.8' Fracture orientation 0 degrees, Rough/Undulating 44.0' Fracture orientation 0 degrees, Rough and Undulating, (ridged due to drilling processes), no evidence of discoloration in fractures 29' - 46' except where noted	41' - 46' interbedded **SHALE** and **LIMESTONE** as 31' - 36', **SHALE** is only at 41' - 41.2', 41.3' - 41.5' and laminate beds once or twice per foot after	R4: 0912 - 09:35 160 gallons Return 160 gallons
50	R5 100%	95%	0 1 0 2 2	47.7' Fracture orientation 0 degrees, Smooth and Undulating 49.6', 49.8' Fracture orientation 0 degrees, Rough and Undulating 50.6', 50.7' weathered Shale, fracture orientation 0 degrees, Smooth/Undulating, no evidence of discoloration in fractures except where noted	46' - 51' Interbedded **LIMESTONE** and **SHALE**, **SHALE** and **LIMESTONE** at 48.2' - 49.2', 50.3' - 51.0'	R5: 10:30 - 10:55 125 gallons 100% return
55	R6 5%	97%	2 1 1 0 2	51.3', 51.4' Fracture orientation 0 degrees, Rough and Planar 52.0' Fracture orientation 0 degrees, Smooth/Undulating 53.5' Fracture orientation 0 degrees, Smooth and Planar 55.3', 55.8' Fracture orientation 0 degrees, Rough and Undulating, No evidence of discoloration in fractures	51' - 56' Interbedded **SHALE** and **LIMESTONE**, **SHALE** medium dark gray (N4) to dark gray (N3), laminate bedding, strong rock, very close to closely fractured, sound to moderately fractured, fine grained, fresh, slightly weathered. **LIMESTONE** light gray (N7) to medium gray (N5) fine to medium grained, trace coarse grains, sound, fresh, unweathered	R6: 12:46 - 12:58 125 gallons 100% return No bentonite
60	R7 100%	93%	1 0 1 1	56.7' Fracture orientation 0 degrees, Smooth and Planar 57.0' Fracture orientation 0 degrees, Rough and Undulating 58.4' Fracture orientation 0 degrees, Smooth and Planar	56' - 60' same as above	R7: 13:10 - 13:21 90 gallons 100% return No bentonite

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork
Site Location: NBPLF
Weather:
Drilling Contractor: Cascade
Drilling Method and Equipment Used: Mini Sonic HQ Wireline
Water Level:
Start Date & Time: 7/18/18 at 08:20
End Date & Time: 7/18/18 at 14:02
Logged By: L. Martin

Feet BGS	Core Run Length and Recovery (%)	Discontinuous: RQD (%)	Discontinuous: Fractures per Foot	Discontinuous: Core Description (Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness)	Lithology (Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics)	Comments (Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.)
	R7 100%	93%	1	60.5' Fracture orientation 0 degrees, Smooth and Undulating	60' - 61' Same as 56' - 60'	
	R8 96%	96%	0		61' - 66' same as above, bioturbation and other disturbed bedding planes indicating disturbances during deposition	R8: 13:29 - 13:49 115 gallons Recover 90 gallons
			1	62'.0' Fracture orientation 0 degrees, Rough and Planar		
			1	63.5' Fracture orientation 30 degrees, Rough and Undulating		Water logs at 64.5'
65			0			
			1	65.2' Fracture orientation 0 degrees, Smooth and Planar		
	R9 8%	88%	2	66.3', 66.4' Fracture orientation 0 degrees, Smooth and Planar, 66' - 66.3' multiple healed fractures, orientation 0 degrees, Smooth and Planar	66' - 68' same as above, bioturbation and other disturbed bedding planes indicating disturbances during deposition	R9: 13:55 - 14:02 45 gallons 0 recovery
68			0			
					End of boring at 68' bgs	Driller: well borehole has to be 1' overdrilled to install well at 67' bgs in bedrock
70						
75						
80						
85						
90						

ch2m:

Iowa Army Ammunition Plant, Middletown, IA
Project 679172CH

Boring ID NBPLF - MW4

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF
Weather: mid 30s, sunny **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Rotosonic (ID: 4"/OD: 6")
Water Level: N/A **Start Date & Time:** 4/15/2020 at 11:30 **End Date & Time:** 4/15/2020 at 14:30 **Logged By:** Ian Bingeman

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description: USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments: Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	0-5	5.0	1	OH	0 - 0.5' - **OH:** Organic clay, dark yellow brown (10YR 3/6), moist, soft, high plasticity	0.0 ppm
				CL	0.5 - 5' - **CL:** Clay, yellowish brown (10YR 5/6), moist, some orange mottling, medium to high plasticity, wet at 4.5'	0.0 ppm 0-5' - Cleared with hand auger
5	5-10	5.0	2	CL	5 - 9' - **CL:** Clay, brownish yellow (10YR 6/8)	0.0 ppm
				CL	9 - 10' - **CL:** Clay, brownish yellow (10YR 5/2), medium plasticity, trace silt	0.0 ppm
10	10-15	5.0	3	CL	10 - 14' - **CL:** Clay, brownish yellow (10YR 5/2), some orange mottling, moist, very stiff	0.0 ppm
				CL	14 - 17.2' - **CL:** Clay, brownish yellow (10YR 5/2), some dark grey mottling, moist, stiff, trace gravel	0.0 ppm
15	15-20	5.0	4	CL	17.2 - 18' - **CL:** Clay, pale brown (10YR 6/3), moist, stiff	0.0 ppm
				CL	18 - 19.3' - **CL:** Clay, pale brown (10YR 6/3), some orange mottling, moist, stiff, trace sand	0.0 ppm
20	20-25	5.0	5	CL	19.3 - 23.2' - **CL:** Clay, pale brown (10YR 6/3), some orange mottling, moist, stiff, some medium sand, trace subangular gravel	0.0 ppm
				SP	23.2 - 24' - **SP:** Medium sand with silt, pale brown (10YR 6/3), moist, loose, poorly graded, trace fine gravel	0.0 ppm
				SC	24 - 24.8' - **SC:** Clayey sand, yellowish brown (10YR 5/6), moist, firm, low plasticity	0.0 ppm
25					Bedrock encountered at 24.8', see rock core log for details	
30						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID NBPLF - MW4	Sheet 2 of 2
	ROCK CORE LOG		

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF
Weather: mid 30s, sunny **Drilling Contractor:** Cascade
Drilling Method and Equipment Used: Rotosonic (ID: 4"/OD: 6")
Water Level: N/A **Start Date & Time:** 4/14/2020 at 1520 **End Date & Time:** 4/15/2020 at 14:30 **Logged By:** Ian Bingeman

Feet BGS	Core Run Length and Recovery (%)	Discontinuous: RQD (%)	Discontinuous: Fractures per Foot	Core Description: Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology: Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments: Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
30	25-30 80%	20% Very poor	-	Mechanically broken, pulverized 2 - 4 inch cores	Limestone Slightly weathered Hard fizz with HCL N-8, Very light grey	30' - Rig chatter 30 gallons of water used 30 - 35 begin at 12:20 end at 12:31
35	30-35 60%	55% Fair	-	Some mechanical breakage Fully competent	Not weathered N-8	
40					End of boring at 35'	
45						
50						
55						

ch2m:	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **NBPLF-MW5**	Sheet 1 of 2

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF

Weather: Sunny 80's **Drilling Contractor:** Dakota Technologies

Drilling Method and Equipment Used: Geoprobe 6620 DT

Water Level: Dry at 25' **Start Date & Time:** 6/5/18 at 15:10 **End Date & Time:** 6/6/18 at 11:15 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)	
	0-5	5.0	DP1	CL	0 - 8' - CL: lean clay, trace sand and silt, brown, moist, stiff, low plasticity	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm	Note: Munsell color chart not available on 6/5/18. Delivered on 6/6/18; used starting at 25' bgs
5	5-10	5.0	DP2			- 0.0 ppm - 0.0 ppm - 0.0 ppm	
				CL	8 - 9.5' - **CL**: lean clay, trace sand and silt, gray and brown, moist, stiff, low plasticity	- 0.0 ppm	
				CL	9.5 - 10' - **CL**: lean clay, trace sand and silt, gray and brown, moist, sticky but not quite saturated, low plasticity	- 0.0 ppm	
10	10-15	5.0	DP3	CH	10 - 15' - **CH**: fat clay, trace sand and silt, brown and gray, mottled black and orange, moist to wet, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm	
15	15-20	5.0	DP4			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm	
20	20-25	5.0	DP5	CH	20 - 25' - **CH**: fat clay, trace sand and silt, trace gravel, brown and gray, mottled black and orange, moist to wet, stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm	Stepped over 1' and discrete sampled 20 - 25' bgs Left holes open overnight to get water levels. 6/6/18 - dry to 25' bgs
25	25-30	4.0	DP6	CH	25 - 26' - **CH**: fat clay, trace gravel and sand, brown, (10YR 4/8), mottled black, moist to wet, soft, seams of black and orange staining	- 0.0 ppm	
				CH	26 - 29' - **CH**: fat clay, trace gravel and sand, brown, (10YR 4/8), mottled black, moist to wet, very stiff, seams of black and orange staining	- 0.0 ppm - 0.0 ppm - 0.0 ppm	
30					29 - 30' - No recovery		

Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	**Boring ID** NBPLF-MW5	Sheet 2 of 2

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF
Weather: Sunny 80's **Drilling Contractor:** Dakota Technologies
Drilling Method and Equipment Used: Geoprobe 6620 DT
Water Level: Dry **Start Date & Time:** 6/5/18 at 15:10 **End Date & Time:** 6/6/18 at 11:15 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	30-35	5.0	DP7	CH	30 - 43.5' - **CH**: fat clay, trace gravel and sand, brown (10YR 4/3), trace black mottling, moist, soft to very stiff, weathered	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
35	35-40	2.5	DP8			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
40	40-45	5.0	DP9	CL	43.5 - 45' - **CL**: lean clay with gravel and sand, very dark gray, (5Y 3/1), moist to dry, hard, pockets of sand and weathered shale	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
45	45-49	4.0	DP10	CH	45 - 48.5' - **CH**: fat clay, trace gravel and sand, brown (10YR 4/3), trace black mottling, moist, soft to very stiff, weathered	- 0.0 ppm - 0.0 ppm - 0.0 ppm
					48.5 - 49' - weathered shale and limestone/dolomite	- 0.0 ppm Refusal at 49' bgs on bedrock
					End of boring at 49' bgs	
50						
55						
60						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID **NBPLF - MW6**	Sheet 1 of 2
		BORING LOG	

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF

Weather: low to mid 30s, light snow, sunny **Drilling Contractor:** Cascade

Drilling Method and Equipment Used: Rotosonic (ID: 4"/OD: 6")

Water Level: N/A **Start Date & Time:** 4/14/2020 at 14:30 **End Date & Time:** 4/15/2020 at 09:20 **Logged By:** Ian Bingeman

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	**Soil Description** USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	**Comments** Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
0-5	0-5	5.0	1	OH SP CL	0 - 2' - **OH:** Organic clay, dark yellowish brown (10YR 3/6), moist, soft, high plasticity, trace fine sand 2 - 2.5' - **SP:** Sand with gravel, moist, loose, poorly graded, little clay 2.5 - 5' - **CL:** Clay with trace sand, yellowish brown (10YR 5/6), some orange mottling, medium stiff, medium plasticity	0.0 ppm 0.0 ppm 0.3 ppm 0-5' - Cleared with hand auger
5	5-10	5.0	2	CL	5 - 13' - **CL:** Clay, brown (10YR 4/3), dry, stiff, some black mottling, low plasticity, trace silt	0.0 ppm 0.0 ppm
10	10-15	5.0	3	 CL	 13 - 15.7' - **CL:** Clay, brown (10YR 4/3), stiff, some black mottling, appearance of glacial till gravel in clay (subangular gravel)	0.0 ppm 0.0 ppm
15	15-20	5.0	4	CL SC	15.7 - 19.1' - **CL:** Clay, brown (10YR 6/3), stiff, increasing sand content 19.1 - 20' - **SC:** Clayey sand, light grey (10YR 7/1), dry, stiff, low plasticity	0.0 ppm 0.0 ppm
20	20-25	5.0	5	CL CL CH	20 - 22.7' - **CL:** Clay, dark grey (10YR 4/1), dry, low plasticity, little sand 22.7 - 23.9' - **CL:** Clay, dark grey (10YR 4/1), dry, medium plasticity, little sand 23.9 - 25' - **CH:** Clay, dark grey (10YR 4/1), moist to wet, high plasticity, little sand	0.1 ppm 0.0 ppm 0.0 ppm
25	25-30	5.0	6	CL	25 - 30.2' - CL: Clay, yellowish brown (10YR 5/6), dry, very stiff, low plasticity, some sand Bedrock encountered at 30.2', see rock core log for details	0.0 ppm
30						

ch2m:	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID NBPLF - MW6	Sheet 2 of 2

BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF

Weather: low to mid 30s, light snow, sunny **Drilling Contractor:** Cascade

Drilling Method and Equipment Used: Rotosonic (ID: 4"/OD: 6")

Water Level: N/A **Start Date & Time:** 4/14/2020 at 14:30 **End Date & Time:** 4/15/2020 at 09:20 **Logged By:** Ian Bingeman

Feet BGS	Core Run Length and Recovery (%)	Discontinuous: RQD (%)	Discontinuous: Fractures per Foot	Discontinuous: Core Description — Depth, Type, Orientation, Roughness, Planarity, Infilling, Material and Thickness, Surface Staining and Tightness	Lithology — Rock Type, Color, Mineralogy, Texture, Weathering, Hardness and Rock Mass Characteristics	Comments — Size and Depth of Casing, Fluid Loss, Coring Rate and Smoothness, Caving, Rod Drops, Test Results, Etc.
	30-34 100%	-	-	30.7' - Mechanically broken 32' - Mechanically fractured, Competent bedrock	30.2' - Weathered bedrock, Saprolite 30.7' - Limestone 32' - Limestone	30.7' - Fizzed with HCL 32' - Hard drilling, rock observed, rig chatter
35	34-38 100%	-	-	Mechanically fractured, Competent bedrock	Limestone	Drilled to 38' to match JAW-627
40					End of boring at 38'	
45						
50						
55						
60						

ch2m	Iowa Army Ammunition Plant, Middletown, IA Project 679172CH	Boring ID NBPLF-MW7	Sheet 1 of 2

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF

Weather: Sunny 80's **Drilling Contractor:** Dakota

Drilling Method and Equipment Used: Geoprobe 6620 DT

Water Level: **Start Date & Time:** 7/12/18 at 10:37 **End Date & Time:** 7/12/18 at 11:25 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
5	0-5	5.0	DP1	CL	0 - 5' - **CL**: lean clay, trace gravel and sand, brown, (7.5YR 4/4), mottled black, moist to dry, very stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
10	5-10	5.0	DP2	CH	5 - 10' - **CH**: fat clay, trace gravel and sand, brown, (7.5YR 4/4), mottled black, moist to dry, very stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm In borehole at 0 - 10': O2 - 20.9% CO - 0.0 ppm H2S - 0.0 ppm LEL - 0% VOCs - 0.0 ppm
15	10-15	5.0	DP3	CH	10 - 15' - **CH**: fat clay, trace sand and gravel, brown, (7.5YR 4/4), mottled black, moist, very stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm
20	15-20	5.0	DP4	CL	15 - 20' - **CL**: lean clay, trace gravel and sand, dark yellowish brown, (10YR 4/4), mottled black, moist, very stiff	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm In borehole at 20': O2 - 20.9% CO - 0.0 ppm H2O - 0.0 ppm LEL - 0% VOCs - 0.0 ppm
25	20-25	5.0	DP5	CL CH	20 - 22.5' - **CL**: lean clay, dark yellowish brown, (10YR 4/4), moist, very stiff, trace gravel and sand, mottled black 22.5 - 30' - **CH**: fat clay, trace sand and gravel, very dark grayish brown, (2.5Y 4/2), moist, very stiff, sand seam at 22.8' bgs, sand is loose and wet, seam is less than 0.1' thick, shear 45 degree surface noted at 29' bgs	- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm Rods are not wet when retrieving next interval (25-30')
30	25-30	5.0	DP6			- 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm - 0.0 ppm

SOIL BORING LOG

Project: Iowa Army Ammunition Plant RI Fieldwork **Site Location:** NBPLF
Weather: **Drilling Contractor:** Dakota
Drilling Method and Equipment Used: Geoprobe 6620 DT
Water Level: **Start Date & Time:** 7/12/18 at 10:37 **End Date & Time:** 7/12/18 at 11:25 **Logged By:** Lauren Martin

Feet BGS	Sample Interval (ft)	Recovery (ft)	#/Type	USCS Code	Soil Description USCS soil name, USCS group symbol, color, moisture content, relative density, or consistency, soil structure, mineralogy	Comments Remarks, depth of casing, drilling & fluid loss, tests, breathing zone PID (ppm)
	30-31	1.0	DP7	CH	30 - 30.5' - **CH**: fat clay, trace sand and gravel, very dark grayish brown, (2.5Y 4/2), moist, very stiff	- 0.0 ppm
					30.5 - 31' - weathered bedrock, dry	Driller: refusal at 31' bgs Place 5' of bentonite in hole and then put in 1" piezometer
					End of boring 31'	- 0.0 ppm
35						
40						
45						
50						
55						
60						

h2m

Groundwate. ampling Form

Project Name: JAAAP RI
Sample Source (Well No./Location): CW-P
Weather Conditions: Partly cloudy, 83°
Well Condition: Fair
Sample Team: Joshua Hansen
Sample Equipment: Peristaltic pump

Project Number: 679172
Date: 6/24/18

Sheet 1 of 1

Water Quality Parameter Information

Datum:
Well Depth: (ft)
Static Water Level: 5.28 (ft)
Water Column: (ft)
Diameter/Type: ~~2"~~ 4"

Equipment ~~Well~~ Volume:
1V = ~0.5L ~~(gal)~~

Time Purging begins (T_o) 1242
Water Level at time T_o 5.28
Time Purging ends (T_1) 1307
Water Level at time T_1 6.14

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm)^c ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±0.5	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) <50	Appearance
1247	1	6.90	0.88	17.1	131.4	5.66	3.80	31.0	Flow = 200 ml/min light gray
1252	1.5	6.89	0.93	19.4	126.0	5.82	3.85	26.3	flow = 120 ml/min
1257	2	6.90	1.05	19.2	124.4	5.98	3.80	45.6	Flow = 100 ml/min
1302	2.5	6.89	1.05	19.0	124.0	6.05	3.74	41.0	" "
1307	3	6.88	1.04	19.4	123.7	6.14	3.72	44.4	" "

Sample Information

Sample ID: CW-P-0618
Analysis: Explosives
Date: 6/24/18
Time: 1310
Field Filtering: No Filter Type —
Laboratory: Method of Shipment:
Remarks: low flow method, pump intake mid-screen

Groundwate.   ampling Form

Project Name: IAAAP RI
Sample Source (Well No./Location): JAW-626
Weather Conditions: Partly cloudy
Well Condition: 2"
Sample Team: Joshua Hansen
Sample Equipment: Peristaltic

Project Number: 679172
Date: 6/24/18

Sheet 1 of 1

Water Quality Parameter Information

Datum:
Well Depth: (ft)
Static Water Level: 6.02 (ft)
Water Column: (ft)
Diameter/Type: 4"

Equipment ~~Well~~ Volume:
1V = ~0.5 L ~~(gal)~~

Time Purging begins (T_o) 1404
Water Level at time T_o 6.08
Time Purging ends (T_1) 1435
Water Level at time T_1 7.01

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm)[c] ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±0.5	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) <50	Appearance
1409	1.5	6.71	0.460	16.5	167.8	6.85	5.43	14.4	Flow = 300
1414	2.3	6.58	0.400	17.0	168.3	7.01	4.84	13.7	Flow to 175 ml/min
1419	2.8	6.57	0.398	17.5	168.1	7.01	4.54	33.0	Flow = 100 ml/min
1424	3.3	6.58	~~0.5~~ 0.409	17.4	166.9	7.01	4.59	21.6	" "
1429	3.8	6.58	0.417	17.1	166.2	7.01	4.53	8.20	" "
1435			Collect	Sample					

Sample Information

Sample ID: JAW-626-0618
Analysis: Explosives
Date: ~~X~~ 6/24/18
Time: 1435
Field Filtering: NO   Filter Type —
Laboratory: Method of Shipment:
Remarks: low flow method, pump intake mid screen

ch2m:

Groundwater Sampling Form

Project Name:
Sample Source (Well No./Location): JAW-627
Weather Conditions: Partly cloudy
Well Condition: Needs paint & J-plug
Sample Team: J. Hansen, Dean Johnson
Sample Equipment: ~~Peristo~~ Bailer

Project Number:
Date: 6/25/18

Sheet __ of __

Water Quality Parameter Information

Datum:
Well Depth: 39.97 (ft)
Static Water Level: 34.40 (ft)
Water Column: 5.57 (ft)
Diameter/Type: 4"

Well Volume:
1V = 3.67 (gal)
3V = 11 gallons

Time Purging begins (T_o) 1100
Water Level at time T_o 34.40
Time Purging ends (T_1) 1155
Water Level at time T_1 35.32

Time	Volume Removed ~~ft~~ gal	pH ±0.1	SPCOND.(mS/cm)[c] ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±0.5	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) <50	Appearance
1102	0.25	7.25	0.82	14.2	78.2	— NM	7.59	186	
1104	0.5	7.29	0.85	13.5	80.4	34.64	7.51	41.1	
1106	0.75	7.25	0.86	13.6	84.2	34.64	7.55	26.0	
1113	2.25	7.28	0.86	13.2	100.0	35.23	7.61	66.9	
1121	4	7.26	0.87	12.9	103.5	35.23	~~7~~ 6.70	53.3	
1130	6.25	7.27	0.88	13.0	107.2	35.23	7.21	35.7	
1137	7.5	7.29	0.85	13.5	111.6	35.31	7.30	34.4	
1145	9.25	7.30	0.87	13.2	111.8	35.32	7.26	19.8	
1154	11	7.30	0.88	13.0	114.9	35.32	7.39	15.0	

Sample Information

Sample ID: JAW-627-0618
Analysis: Explosives
Date: 6/25/18
Time: 1200
Field Filtering: None
Filter Type: N/A
Laboratory: TA
Method of Shipment:
Remarks: 3 well volume method

h2m

Groundwate ampling Form

Project Name: IAAAP RI
Sample Source (Well No./Location): NEPLF-MW1
Weather Conditions: Clear, 74°
Well Condition: Good
Sample Team: Jestra Hansen
Sample Equipment: Peristaltic

Project Number: 679172
Date: 6/24/18

Sheet 1 of 1

Water Quality Parameter Information

Datum:
Well Depth: 70.31 (ft)
Static Water Level: 20.50 (ft)
Water Column: 49.81 (ft)
Diameter/Type: 2"

~~Well Volume:~~ Equipment Volume
1V = ~0.5L ~~(gal)~~

Time Purging begins (T_0) 0938
Water Level at time T_0 20.50
Time Purging ends (T_1) ~~093~~ 1010
Water Level at time T_1 22.53

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm)[c] ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±0.5	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) <50	Appearance
0945	~~2~~ 0.8	7.02	0.71	~~2~~ 18.9	142.1	21.25	1.97	18.9	Clear, Flow 100 mL/min
0950	1.2	7.07	0.71	21.5	138.8	21.79	2.88	16.4	Clear
0955	1.7	7.08	0.71	22.4	139.2	21.93	2.58	13.1	Clear
1000	2.2	7.08	0.71	22.6	139.3	22.29	2.07	11.9	Clear, ~~6~~75 mL/min flow rate
1005	2.~~7~~6	7.09	0.71	22.8	139.3	22.38	1.99	11.6	Clear
1010	2.9	7.09	0.70	23.1	139.2	22.~~49~~53	2.05	10.7	Clear

Sample Information

Sample ID: NEPLF-MW1-0618
Analysis: Explosives
Date: 6/24/18
Time: 1015
Field Filtering: No Filter Type
Laboratory: Method of Shipment:
Remarks: Clear, Low Flow Purge, pump intake mid screen

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: ~~EBP-MW17~~ NBPLF-MW3
Site: IAAAP NBP
Field Crew: Joshua Hansen
Date: 3/25/19 **Project #:**

Well Depth (ft.): 67
DTW (ft.): 32.13
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Bladder Pump Low Flow
WL # C103342
Water Quality Meter: YSI # C103142
Turbidimeter # C103314

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	163	5"	1.020
3"	367	6"	1.469
4"	653	8"	2.611

Begin 1353

Field Parameters

	Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1400	32.31	400	0.6	7.54	12.4	0.67	-173.6	0.69	72.3	
	1421	43.80	400	2.25	7.52	12.6	0.67	-186.3	0.16	40.2	
	1424	44.02	100	2.3	7.51	12.4	0.67	-180.7	0.20	39.9	↑ rate
	1456	57.72	100	5	7.51	13.0	0.68	-157.4	0.30	21.1	
	1459	57.88	100	5.1	7.55	13.0	0.68	-158.4	0.32	21.4	
	1508	59.55	100	5.3	7.61	12.7	0.68	-154.4	0.29	48.7	↑ rate
	1515	60.08	100	5.7	7.57	12.7	0.68	-157.8	0.27	27.9	
	1518	60.10	100	5.8	7.55	12.7	0.68	-157.3	0.27	33.4	
	1521	60.10	~~100~~ 60	5.9	7.56	12.9	0.68	-157.2	0.28	27.4	
	1524	60.12	~~100~~ 60	6.0	7.53	13.2	0.68	-156.1	0.29	26.7	
	1527	60.14	60	6.0	7.55	13.3	0.68	-155.4	0.30	26.3	
Post-Purge											

Remarks:
Pump Intake Depth: 65 ft bgs
Control Box Setting (Hz):
Sampling: (Sample at 100-250 ml/min) 60 ml/min

SAMPLING

Depth to Water Before Sampling: 60.14
Sample Methodology: Bladder Pump
Sample Name: NBPLF-MW3-0319
QC Sample: —
Sample Date/Time: 3/25/19 1530
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations:
Parameters: Explosives

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: NBPLF-MW4		Site: IAAAP	
Field Crew: Dave Kortjohn		Date: 4/20/20	Project #:

		Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
Well Depth (ft.): 37.20	Purge Methodology: Monsoon pump	2"	.163	5"	1.020
DTW (ft.): 27.57		3"	.367	6"	1.469
Water Column (ft.):		4"	.653	8"	2.611
Well Diameter (in.): 2	Water Quality Meter: YSI Quatro Hach 2100				
Gal. per ft.:					
Well Volume (gal.):					

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. mS/cm ~~(mS/cm)~~	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1250	27.57	400		7.09	12.7	0.61	81.7	4.33	232	cloudy
	1255	27.63			7.09	12.9	0.62	75.2	3.97	142	
	1300	27.63			7.08	13.0	0.62	72.3	3.82	97.3	
	1305	27.63			7.07	13.1	0.62	68.9	3.68	64.2	clearing
	1310	27.63			7.07	13.1	0.62	66.3	3.71	51.6	
	1315	27.63			7.07	13.2	0.62	65.9	3.75	48.3	
	1320	27.63			7.07	13.4	0.62	65.1	3.78	47.4	
	1325	27.63			7.07	13.9	0.63	64.9	3.79	47.6	
	1330	27.63		4.0							
Post-Purge											

Remarks: Pump Intake Depth: 34.50' Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

Multigas meter: 0.0ppm VOCs, 20.8% O_2, 0.0ppm H_2S, 0ppm CO, 0% LEL CH_4,

SAMPLING

Depth to Water Before Sampling: 27.63'

Sample Methodology: Monsoon Pump

Sample Name: NBPLF-MW4-0420 QC Sample:

Sample Date/Time: 4/20/20 1330

Sampler / Signature: Dave Kortjohn [signature]

Filtered Metals Collected: Y / N (N circled) Filter Size:

Sample Observations:

Parameters:

h2m

Groundwate. ampling Form

Project Name: IAAAP RI
Project Number: 679172
Sheet 1 of 1
Sample Source (Well No./Location): NBPLF-MW5
Date: 6/24/18
Weather Conditions: Sunny 80°
Well Condition: Good; new
Sample Team: Jestina Hansen
Sample Equipment: Hurricane Pump

Water Quality Parameter Information

Datum:
~~Well Volume~~: Equipment Volume
Time Purging begins (T_0) 1115
Well Depth: (ft)
1V = ~0.5L (gal)
Water Level at time T_0 23.85
Static Water Level: 23.85 (ft)
Time Purging ends (T_1) 1205
Water Column: (ft)
Water Level at time T_1 24.86
Diameter/Type: 2"

Time	Volume Removed (L)	pH ±0.1	SPCOND.(mS/cm)[c] ±1% of full-scale reading (instrument repeatability) or default ±20	TEMP.(C) ±0.5	Redox (mV) ±10	Water level (Ft) <0.3	D.O. (mg/L) ±0.1	Turbidity (NTU) <50	Appearance
1120	1	7.02	0.73	17.0	-23.7	24.49	0.99	512	Flow = 200 ml/min, gray
1125	2	7.02	0.73	16.1	-30.5	24.88	0.73	557	Flow = 150 ml/min, gray
1130	2.8	7.04	0.72	15.8	-41.6	24.89	0.40	311	Flow = 200 ml/min, gray
1135	3.8	7.04	0.74	16.2	-47.9	24.77	0.47	285	" "
1140	4.8	7.04	0.73	16.9	-34.7	24.75	0.38	278	" "
1145	5.8	7.04	0.73	~~17.3~~ 16.3	-47.5	24.71	0.32	149	" "
1155	7.8	7.04	0.73	16.3	-45.9	24.83	0.42	62.3	" "
1200	8.8	7.04	0.73	16.8	-45.4	24.86	0.39	34.3	" "
1205	9.8	7.04	0.73	16.4	-44.2	24.85	0.37	20.8	" "

Sample Information

Sample ID: NBPLF-MW5-0618
Analysis: Explosives
Date: 6/24/18
Time: 1210
Field Filtering: None
Filter Type
Laboratory:
Method of Shipment:
Remarks: Clear, low flow purge, pump intake mid screen

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: NBPLF-MW6
Site: IAAAP
Field Crew: Dave Kortjohn
Date: 4/21/20 Project #:

Well Depth (ft.): 39.30
DTW (ft.): 32.96
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Monsoon pump

Water Quality Meter: YSI Quatro, Hach 2100

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1215	32.96	300		7.05	13.5	0.74	111.4	3.54	>1000	cloudy
	1220	34.84			7.06	13.7	0.76	104.2	2.93	>1000	
	1225	36.50			7.07	13.9	0.78	97.0	2.44	>1000	
	1230	37.70			7.04	14.3	0.78	78.7	2.17	683	
	1235	38.50			7.06	14.5	0.78	79.0	2.09	597	
	1237	well dry		2.5							
Post-Purge											

Remarks: Pump Intake Depth: 38.00'
Control Box Setting (Hz):
Sampling: (Sample at 100-250 ml/min)

Sample collected after recharge on 4/21/20 at 1415

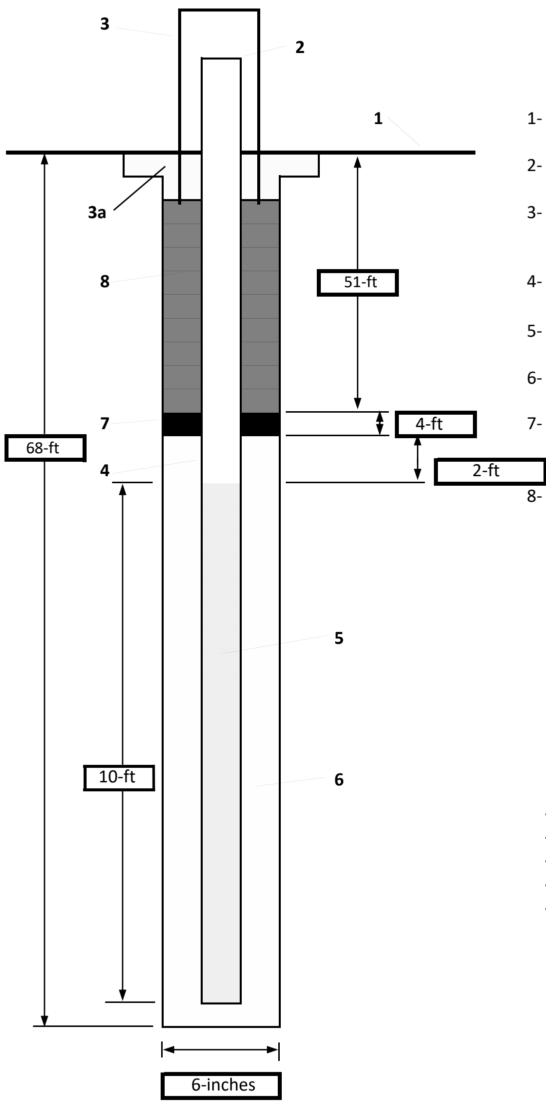
SAMPLING

Depth to Water Before Sampling: 33.21
Sample Methodology: Monsoon pump
Sample Name: NBPLF-MW6-0420 QC Sample:
Sample Date/Time: 4/21/20, 1415
Sampler / Signature: Dave Kortjohn [signature]
Filtered Metals Collected: Y N Filter Size:
Sample Observations:
Parameters:

PROJECT NUMBER	WELL NUMBER	
679172CH	NBPLF-MW3	SHEET 1 OF 1

WELL CONSTRUCTION DIAGRAM

PROJECT : Iowa Army Ammunition Plant RI Investigation   Location: North Burn Pads Landfill
PROJECT MANAGER: J. Morrison
DRILLING CONTRACTOR : Cascade
DRILLING METHOD AND EQUIPMENT USED : MiniSonic 6" Rods
WATER LEVELS : NA   START DATE/TIME: 7/18/2018 at 16:30   END DATE/TIME: 7/19/2018 at 08:30



Well Construction Details

1- Ground elevation at well	NM
2- Top of casing elevation	NM
3- Wellhead protection cover type	Stickup
a) concrete pad dimensions	
4- Length (ft) & dia. (in) of well casing	2-inch Schedule 40 PVC
5- Length (ft) & slot size (in) of screen	0.010-inch Slotted Screen
6- Type screen filter & quantity used	FilterSil, 4 50-lb bags
7- Type of seal & quantity used	HolePlug, 1 50-lb bags
8- Grout	
a) Grout mix used	Quikgrout mix, 46 gallons

Well Development Details

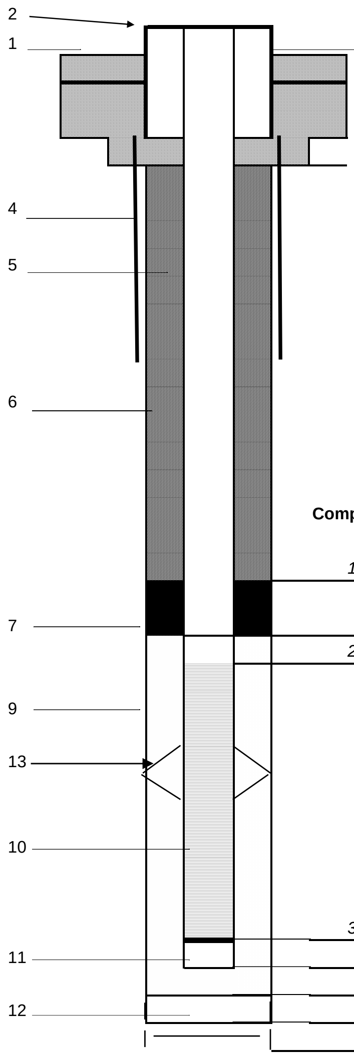
Development method	NA
Development time	NA
Estimated purge volume	NA
Comments	Centralizers at 57' and 67' bgs

LOGGED BY: L. Martin	SIGNATURE:	DATE: 7-19-2018
DEVELOPED BY:	SIGNATURE:	DATE:
CHECKED BY:	SIGNATURE:	DATE:

PROJECT NUMBER	WELL NUMBER
679172CH	**NBPLF-MW4**

WELL COMPLETION DIAGRAM

PROJECT NAME :	*IAAAP RI*	LOCATION NAME:	*North Burn Pad Landfill*
NORTHING:	*302655.975* EASTING: *2276523.565*	DRILLING CONTRACTOR:	*Cascade*
START DATE:	*04-15-2020* END DATE: *04-19-2020*	DRILLING METHOD:	*Rotosonic*
BOREHOLE DIAMETER:	*6* inches	DRILLING EQUIPMENT:	*6 inch OD / 4 inch ID rods*
TOTAL BOREHOLE DEPTH:	*35* feet bgs	LOGGED BY:	*Ian Bingeman (PHL)*



Component Depths BGS

19.5	Top of transition seal (feet bgs)
23	Top of filter pack (feet bgs)
24.5	Top of screen (feet bgs)
34.5	Bottom of screen (feet bgs)
35	Bottom of sump (feet bgs)
35	Bottom of filter pack (feet bgs)
35	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*675.290*	feet msl
2- Top of casing elevation	*677.520*	feet msl
3- Surface completion type	*Steel protective casing*	
a) Protective casing dimensions	*4 feet long / 4 inches wide*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	*-*	inches
b) Length	*-*	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*27*	feet (including stick-up)
6- Sanitary seal type	*Bentonite quick grout*	
a) Method of placement	*Gravity fed*	
b) Volume used	*15*	gallons
c) Calculated volume	*3.8* feet^3 -	gallons
7- Transition seal type	*Hydrated medium bentonite chips*	
a) Quantity used	*0.75*	50 lb bags
b) Calculated quantity	*0.6* feet^3 -	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	*-*	50 lb bags
b) Calculated quantity	*-* feet^3 -	50 lb bags
9- Filter pack type	*#15 sand - red flint*	
a) Quantity used	*3.5*	50 lb bags
b) Calculated quantity	*1.75* feet^3 -	50 lb bags
10- Screen type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*Schedule 40 PVC end cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	*-*	
b) Calculated quantity	*-* feet^3	
13- Centralizer type	*-*	
a) Depths	*-*	feet bgs

Well Development

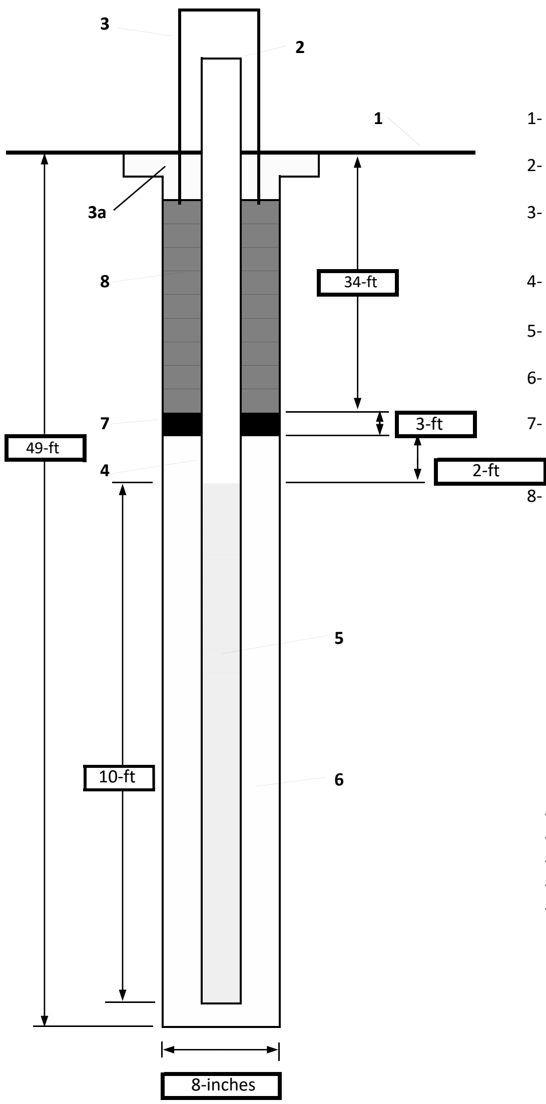
Start Date/Time:	*04-18-2020 / 9:25*	
End Date/Time:	*04-18-2020 / 9:55*	
Measured Depth to Water	*27.78*	feet btoc
Development Method:	*Submersible pump*	
Duration:	*0.5*	hours
Purge volume:	*7.5*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*1.53*	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

PROJECT NUMBER	WELL NUMBER	
679172CH	NBPLF-MW5	SHEET 1 OF 1

WELL CONSTRUCTION DIAGRAM

PROJECT : Iowa Army Ammunition Plant RI Investigation — Location: North Burn Pads Landfill
PROJECT MANAGER: J. Morrison
DRILLING CONTRACTOR : Dakota
DRILLING METHOD AND EQUIPMENT USED : Geoprobe 6620DT, 4.25" ID Augers
WATER LEVELS : NA — START DATE/TIME: 6/6/2018 at 11:30 — END DATE/TIME: 6/7/2018 at 07:45



Well Construction Details

1- Ground elevation at well: NM
2- Top of casing elevation: NM
3- Wellhead protection cover type:
a) concrete pad dimensions:
4- Length (ft) & dia. (in) of well casing: 2-inch Schedule 40 PVC
5- Length (ft) & slot size (in) of screen: 0.010-inch Slotted Screen
6- Type screen filter & quantity used: Premier Silica, 8 bags
7- Type of seal & quantity used: Bentonite Plug, 1.5 bags
8- Grout
a) Grout mix used: Grout-well DF, 80 gallons

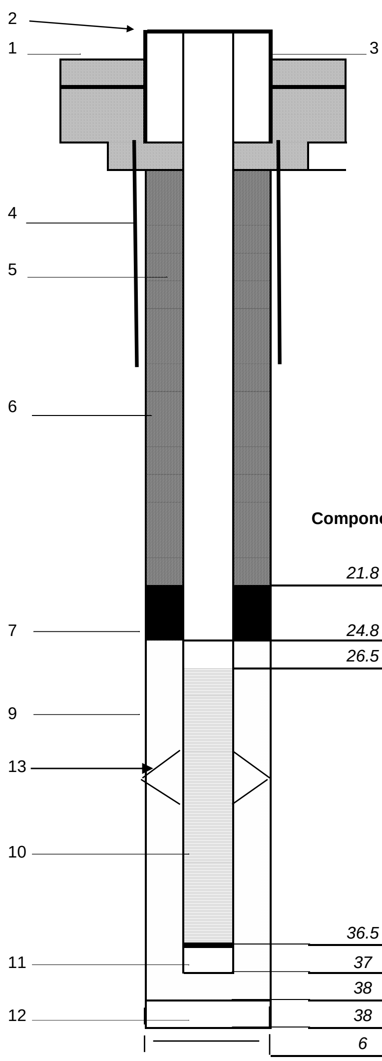
Well Development Details

Development method: NA
Development time: NA
Estimated purge volume: NA
Comments:

LOGGED BY: L. Martin — SIGNATURE: — DATE: 6-7-2018
DEVELOPED BY: — SIGNATURE: — DATE:
CHECKED BY: — SIGNATURE: — DATE:

ch2m	PROJECT NUMBER 679172CH	WELL NUMBER **NBPLF-MW6**
	WELL COMPLETION DIAGRAM	

PROJECT NAME :	*IAAAP RI*	LOCATION NAME:	*North Burn Pad Landfill*
NORTHING: *302752.342*	EASTING: *2276498.189*	DRILLING CONTRACTOR:	*Cascade*
START DATE: *04-15-2020*	END DATE: *04-19-2020*	DRILLING METHOD:	*Rotosonic*
BOREHOLE DIAMETER: *6* inches		DRILLING EQUIPMENT:	*6 inch OD / 4 inch ID rods*
TOTAL BOREHOLE DEPTH: *35* feet bgs		LOGGED BY:	*Ian Bingeman (PHL)*



Component Depths BGS

21.8	Top of transition seal (feet bgs)
24.8	Top of filter pack (feet bgs)
26.5	Top of screen (feet bgs)
36.5	Bottom of screen (feet bgs)
37	Bottom of sump (feet bgs)
38	Bottom of filter pack (feet bgs)
38	Bottom of borehole (feet bgs)
6	Borehole Diameter (inches)

NOTE: DRAWING NOT TO SCALE

1- Ground elevation at well	*680.060*	feet msl
2- Top of casing elevation	*682.630*	feet msl
3- Surface completion type	*Steel protective casing*	
a) Protective casing dimensions	*4 feet long / 4 inches wide*	
b) Concrete pad dimensions	*24 x 24*	inches
c) Bollards	*3*	
4- Conductor casing type	*None*	
a) Diameter	*-*	inches
b) Length	*-*	feet
5- Well casing type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*29*	feet (including stick-up)
6- Sanitary seal type	*Bentonite quick grout*	
a) Method of placement	*Gravity fed*	
b) Volume used	*15*	gallons
c) Calculated volume	*4.1* feet^3 -	gallons
7- Transition seal type	*Hydrated medium bentonite chips*	
a) Quantity used	*0.75*	50 lb bags
b) Calculated quantity	*0.6* feet^3 -	50 lb bags
8- Transition filter pack type	*None*	
a) Quantity used	*-*	50 lb bags
b) Calculated quantity	*-* feet^3 -	50 lb bags
9- Filter pack type	*#15 sand - red flint*	
a) Quantity used	*4.5*	50 lb bags
b) Calculated quantity	*2.25* feet^3 -	50 lb bags
10- Screen type	*Schedule 40 PVC*	
a) Diameter	*2*	inches
b) Length	*10*	feet
c) Slot size	*0.010*	inches
11- Sump / end cap type	*Schedule 40 PVC end cap*	
a) Diameter	*2*	inches
b) Length	*0.5*	feet
12- Backfill type	*None*	
a) Quantity used	*-*	
b) Calculated quantity	*-* feet^3	
13- Centralizer type	*-*	
a) Depths	*26*	feet bgs

Well Development

Start Date/Time:	*04-18-2020 / 10:30*	
End Date/Time:	*04-18-2020 / 11:15*	
Measured Depth to Water	*33.06*	feet btoc
Development Method:	*Submersible pump*	
Duration:	*0.75*	hours
Purge volume:	*2.5*	gallons
Volume of water injected:	*0*	gallons
Calculated casing volume:	*1.0*	gallons

Comments: *bgs = Below ground surface. btoc=Below top of casing. lb = Pound. msl = Mean sea level. NA = Not applicable. PVC = Polyvinyl chloride*

Purged dry during well development on 04-18-2020 (2.5 gallons purged)

ch2m

PROJECT NUMBER	WELL NUMBER
679172	~~[illegible]~~ NBPLF-MW3 SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: IAAAP
LOCATION: NBPLF
DEVELOPMENT CONTRACTOR: Cascade
LOGGER: L. Martin
DEVELOPMENT METHOD AND EQUIPMENT USED: Pump & tank
START: 1610 8-20-18
END: 1715 8-20-18

START WATER LEVELS: 34.72'
WELL DEPTH: 69.78'
WELL VOLUME: 5.71 gallons
MAXIMUM DRAWDOWN DURING DEVELOPMENT: Dry
TOTAL QUANTITY OF WATER DISCHARGED: 17 gallons
DISPOSITION OF DISCHARGE WATER: very turbid

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1620	Begin surging						
1633	Finish Surging			begin	purging		water is very turbid
1646	well is dry						
1655	12	64.0'	—	—	—	—	begin purge
1657	15	Dry	—	—	—	—	stop purge
1710	15	65.9	—	—	—	—	begin purge
1711	17	Dry	—	—	—	—	stop purge

SOP-16_Well Development Form

4-18-20

ch2m

PROJECT NUMBER	WELL NUMBER NBPLF-MW4	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: IAAAP LOCATION: NBPLF - IAAAP
DEVELOPMENT CONTRACTOR: Jacobs LOGGER:
DEVELOPMENT METHOD AND EQUIPMENT USED: geotech Submersible pump, YSI pro plus, Turbidity meter, water level meter
START: 925
END: 953

START WATER LEVELS: 27.78
WELL DEPTH: 37.18
WELL VOLUME: 1.53 gal 3 well vol: 4.59 gal
MAXIMUM DRAWDOWN DURING DEVELOPMENT: 28.03
TOTAL QUANTITY OF WATER DISCHARGED: 7.5 gal
DISPOSITION OF DISCHARGE WATER:

	Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
Tapped on Bottom w/ pump	925	—	27.78	over	11.6	6.98	0.669	light Brown/tan, opaque, Milky, No odor A lot of Suspended Sediment
	930	1.5	27.98	over	11.8	6.82	0.681	SAA
	935	3.5	28.01	602	11.8	6.81	0.682	very light tan, opaque, milky, no odor a lot of Suspended Sediment
	940	4.5	28.03	150	11.9	6.82	0.682	No color, no odor, translucent, Suspended Sediment visible
Tapped on Bottom w/ pump	945	5.5	28.00	over	11.9	6.84	0.664	light Brown/tan, opaque, milky, No odor a lot of Suspended Sediment
	950	7.0	28.02	261	11.9	6.82	0.662	No color, No odor, translucent, Suspended Sediment visible
	953	7.5	28.02	73.2	11.9	6.82	0.670	SAA w/ less Sediment

Final DTW: 28.02
Final DTB: 37.19
Purge rate: 0.27 gal/min

Air monitoring
935 - CH4/LEL - 0
H_2S - 0
VOC - 0
O_2 - 20.9
CO - 0

ch2m

PROJECT NUMBER	WELL NUMBER	
679172	NBPLF-MW5	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT : IAAAP LOCATION : NBPLF
DEVELOPMENT CONTRACTOR : Jacobs/PARS LOGGER : L. Martin
DEVELOPMENT METHOD AND EQUIPMENT USED: 2" surge block, pump
START : 1315 6-19-18
END :

START WATER LEVELS : 24.02
WELL DEPTH: 51.99 27.97
WELL VOLUME: ~~27.97~~
MAXIMUM DRAWDOWN DURING DEVELOPMENT: 3.5 gAl
TOTAL QUANTITY OF WATER DISCHARGED: Dry
DISPOSITION OF DISCHARGE WATER: silty gray turbid.

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1355	2.5	28.72'	####	—	—	—	thick silty gray
~~1315~~ 1400	5.0	38.00	####	14.58	7.07	0.73	" "
1405	7.5	41.90	####	13.80	7.14	0.70	" "
Secured equipment because of thunderstorm. Kept pump going.							

SOP-16_Well Development Form

4-18-20

ch2m

PROJECT NUMBER	WELL NUMBER NBPLF-MW6	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT: IAAAP
LOCATION: NBPLF IAAAP
DEVELOPMENT CONTRACTOR: Jacobs
LOGGER: Spies
DEVELOPMENT METHOD AND EQUIPMENT USED: geotech Submersible pump, YSI proplus, Turbidity meter, Water level meter
START: 1030
END: 1115

START WATER LEVELS: 33.06
WELL DEPTH: 39.20
WELL VOLUME: 1.0 gal 3 well vol: 3 gal
MAXIMUM DRAWDOWN DURING DEVELOPMENT: 37.64
TOTAL QUANTITY OF WATER DISCHARGED: 2.5 gal
DISPOSITION OF DISCHARGE WATER:

Tapped on Bottom w/ pump

Tapped on Bottom w/ pump

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Specific Conductivity (mS/cm)	Remarks (color, odor, sheen, sediment, etc.)
1030	—	33.06	over	12.5	7.06	0.720	very light Brown/tan, milky, opaque, a lot of sed suspended, no odor
1035	1.0	35.65	over	12.8	6.88	0.742	SAA, color change to light Brown/tan
1040	1.5	36.24	over	13.0	6.85	0.781	SAA,
1045	2.0	37.61	over	13.1	6.97	0.803	SAA, Color Change to Brown/Tan
1047	2.25	37.64	over	13.0	7.09	0.811	SAA, well Dry
1115	2.50	37.09	over	13.1	7.07	0.808	SAA

• 1110: WL → 37.12, didn't recharge enough to continue development, pump out remaining water & take 1 more reading

Final DTW: 37.09

Final DTB: 39.20

Purge rate: ~0.12 gal/min

Air monitoring
1040 - CH_4/LEL - 0
H_2S - 0
VOC - 0
O_2 - 20.9
CO - 0

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTA-99-1		Site: ~~tat~~ FTA FAAAP	
Field Crew: [illegible]		Date: 3/19/19	Project #:
Well Depth (ft.): 19.53	Purge Methodology: Peristaltic	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
DTW (ft.): 11.69		2" .163	5" 1.020
Water Column (ft.):		3" .367	6" 1.469
Well Diameter (in.): 2		4" .653	8" 2.611
Gal. per ft.:	Water Quality Meter:		
Well Volume (gal.):	YSI # C103142		

Begin 1549

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1552	12.14	0.4	variable	7.37	9.5	0.529	160.3	1.86	4.49	
	1555	12.15	175	0.5	7.36	10.0	0.542	159.1	2.09	3.72	
	1558	12.18	175	0.7	7.38	10.2	0.539	156.7	1.81	6.16	
	1601	12.18	175	0.8	7.37	10.3	0.533	149.0	1.70	5.31	
	1604	12.20	175	1.0	7.36	10.3	0.528	147.1	1.67	4.07	
Post-Purge											

Remarks: Pump Intake Depth: 19 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 175 ml/min

SAMPLING

Depth to Water Before Sampling: 12.20

Sample Methodology: Peristaltic

Sample Name: FTA-99-1-0319

QC Sample: —

Sample Date/Time: 3/19/19 1605

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N

Filter Size: —

Sample Observations: Clear

Parameters: Explosives, VOCs

ch2m:

TO BE RESAMPLED W/ BLADDER

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: ~~FTA-992~~ (PP) FTA 99-2		Site: TAAAP	
Field Crew: Tora Pnda		Date: 3/19/19	Project #:
Well Depth (ft.): 53.11	Purge Methodology: low flow peri pump	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 16.71			
Water Column (ft.):			
Well Diameter (in.): 2 in			
Gal. per ft.: .163	Water Quality Meter: C-103140		
Well Volume (gal.):			

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1605	20.08	175		7.90	11.6	0.680	176.1	8.0	0.77	
	1609	21.29	250		7.90	11.5	0.680	177.8	7.86	0.48	
	1617	24.58	250		7.92	11.4	0.680	181.1	8.13	0.96	
	1622	26.17	75		7.90	11.5	0.680	183.1	8.11	0.90	
	1625	26.48	75		7.91	11.3	0.680	182.9	7.75	0.81	
	1628	26.72	75		7.99	11.3	0.680	181.4	7.61	0.74	
	1637	28.92	300		7.93	11.6	0.680	169.2	8.24	0.85	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

not purging well - turned up purge rate to see if I can get H_2O in

wont work w/ peri pump - need bladder pump

SAMPLING NO SAMPLES COLLECTED PP

~~Depth to Water Before Sampling: 20.08 (LP)~~

~~Sample Methodology: low flow peri pump~~

~~Sample Name: FTA-99 (PP) FTA 99-2-0319~~ ~~QC Sample:~~

~~Sample Date/Time: 3/19/19 (PP)~~

~~Sampler / Signature: Tora Pnda~~

~~Filtered Metals Collected: Y / N Filter Size:~~

~~Sample Observations:~~

~~Parameters: explosives and VOCs~~

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTA-99-2		Site: FTA	
Field Crew: Jestin Hansen		Date: 3/21/19	Project #:

Well Depth (ft.): 53.13
DTW (ft.): 15.35
Water Column (ft.): 37.78
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.): 6.2

Purge Methodology: Bladder pump

Water Quality Meter:

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1416

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1432	24.37	450	1.5	7.02	11.9	0.76	+52.6	0.49	11.2	
	1458	38.55	100	4.5	7.31	11.3	0.73	63.2	4.72	10.1	Reduce Flow rate to check recharge.
	1501	38.76	100	4.6	7.31	11.2	0.73	63.6	4.99	8.74	Insufficient recharge to low flow, ↑ rate for 3 Vol method
	1515	~~43.60~~ 42.60	250	5.5	7.27	11.9	0.73	65.0	4.40	5.84	Reduce rate to check recharge one more time
	1518	42.60	250	5.7	7.16	11.9	0.74	60.9	2.80	5.72	recharge good, commence w/ low-flow
	1521	42.60	250	5.9	7.15	11.8	0.74	59.4	2.71	4.11	
	1524	42.60	250	6.1	7.12	11.8	0.75	58.0	2.68	4.30	
Post-Purge											

Remarks: Pump Intake Depth: 51 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 250 ml/min

* Based on prior purge attempt with peristaltic, low flow at 29 ft stress level does not work. Will draw to 2 ft above screen & try again. (39.5 ft btoc)

SAMPLING

Depth to Water Before Sampling: 42.60
Sample Methodology: Bladder
Sample Name: FTA-99-2
QC Sample: —
Sample Date/Time: 3/21/19 1525
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N
Filter Size: —
Sample Observations: Clear
Parameters: Explosives, VOCs, ~~metals~~

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW1		Site: FTP IAAAP	
Field Crew: J Hansen Dean Johnson		Date: 3/8/19	Project #:
Well Depth (ft.): 18.35	Purge Methodology: Peristaltic Low-Flow	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): ~~18.35~~ 6.63			
Water Column (ft.): 11.72			
Well Diameter (in.): 2"			
Gal. per ft.: 0.163	Water Quality Meter: #C-103142 YSI		
Well Volume (gal.): 1.91			

Begin purge 1150

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1157	8.10	Variable	0.5	7.10	7.3	0.78	153.0	1.95	28.6	
	1200	8.07	300	0.7	7.04	7.3	0.78	152.0	1.99	25.0	
	1203	7.98	300	0.9	7.05	7.2	0.78	150.3	1.97	11.2	
	1206	7.95	300	1.1	7.05	7.2	0.78	149.2	1.95	10.0	
	1209	7.83	300	1.3	7.05	7.2	0.78	148.7	1.96	9.13	
Post-Purge											

Remarks: Pump Intake Depth: 17 Ft

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling: 7.83

Sample Methodology: Peristaltic

Sample Name: FTP-MW1-0319

QC Sample: —

Sample Date/Time: 3/8/19 1210

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N Filter Size:

Sample Observations: Clear

Parameters: Explosives / VOCs

ch2m:

RESAMPLE : VOCs

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP - MW1	Site: FTA
Field Crew: R. CAIRD	Date: 3/23/2019 Project #: 679172CH - 01.02.DP 03

Well Depth (ft): 18.35'
DTW (ft): 6.46' BTOC
Water Column (ft): 11.89
Well Diameter (in): 2"
Gal. per ft.: 0.163
Well Volume (gal): 1.94
WL METER C103091

Purge Methodology: LOW FLOW PERI PUMP C102516
Water Quality Meter: C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1503	7.20	200	0.15	6.99	8.3	0.54	92.1	2.96	NM	CLEAR
	1506	7.36	200	0.30	6.96	8.1	0.54	94.3	1.64		
	1509	7.45	200	0.45	6.96	7.9	0.53	96.7	1.42		
	1512	7.48	200	0.60	~~6.96~~ 6.95	7.8	0.53	98.9	1.34		
	1515	7.51	200	0.75	6.94	7.6	0.53	99.0	1.26		
Post-Purge											

Remarks: Pump Intake Depth: 13.00' BTOC Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

START PUMP 1500

NM = NOT MEASURED, SEE INITIAL PURGE LOG

SAMPLING

Depth to Water Before Sampling: 7.51' BTOC
Sample Methodology: PERISTALTIC
Sample Name: FTP - MW1 - R0319 QC Sample: –
Sample Date/Time: 3/23/2019 1518
Sampler / Signature: RC
Filtered Metals Collected: Y / (N) Filter Size: –
Sample Observations: –
Parameters: VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW2		Site: FTA	
Field Crew: Jestina Hansen / Dean Johnson		Date: 3/8/19	Project #:
Well Depth (ft.): 19.19	Purge Methodology: Peristaltic	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
DTW (ft.): 11.71		2" .163	5" 1.020
Water Column (ft.):		3" .367	6" 1.469
Well Diameter (in.):		4" .653	8" 2.611
Gal. per ft.:	Water Quality Meter:		
Well Volume (gal.):	YSI # C-103142		

Begin Purge 1018

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1024	14.10	150	0.5	7.26	7.1	0.418	114.0	4.17	180	Light gray
	1027	14.11	150	0.6	7.24	7.0	0.419	110.2	3.61	143	" "
	1030	14.14	150	0.7	7.24	7.2	0.420	92.0	2.10	100	" "
	1033	14.18	150	0.8	7.25	7.1	0.419	86.6	1.50	92.4	" "
	1036	14.20	150	0.9	7.24	7.2	0.418	85.7	1.48	87.0	" "
	1039	14.23	150	1.0	7.26	7.0	0.417	84.7	1.47	46.3	" "
	1042	14.24	150	1.1	7.25	6.7	0.416	82.7	1.42	48.1	" "
	1045	14.25	150	1.2	7.26	6.8	0.415	77.0	1.45	45.9	" "
Post-Purge											

Remarks: Pump Intake Depth: 18 ft Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling: 14.25
Sample Methodology: Peristaltic
Sample Name: FTP-MW2-0319 QC Sample: NO
Sample Date/Time: 3/8/19 1050
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: Explosives, VOCs

ch2m.

RESAMPLE: VOCs

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW2		Site: FTA	
Field Crew: R. CAIRD		Date: 3/23/2019	Project #: 679172CH.01.02.DP.~~03~~04

Well Depth (ft.): 19.19'
1540 DTW (ft.): 11.35' BTOC
Water Column (ft.): 7.84'
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.): 1.278 GAL
WL METER C-103091

Purge Methodology: LOW-FLOW PERI PUMP C102516

Water Quality Meter: C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1550	11.80	200	0.15	7.18	7.7	0.185	107.9	4.38	NM	
	1553	12.01	200	0.30	7.06	7.5	0.185	114.8	4.07		
	1556	12.21	200	0.45	7.05	7.6	0.185	120.1	4.02		
	1559	12.34	200	0.60	7.02	7.5	0.189	120.8	4.03		
	1602	12.47	200	0.75	7.06	7.6	0.188	120.4	4.41		
Post-Purge											

Remarks: Pump Intake Depth: 15.00' BTOC Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

PUMP ON 1547

NM = NOT MEASURED, SEE INITIAL PURGE LOG

SAMPLING

Depth to Water Before Sampling: 12.47' BTOC
Sample Methodology: PERISTALTIC
Sample Name: FTP-MW2-R0319 QC Sample: —
Sample Date/Time: 3/23/2019 1605
Sampler / Signature: RC
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations: —
Parameters: VOCs

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW3	Site: FTP
Field Crew: J Hansen / D. Johnson	Date: 3/8/19 Project #:

Well Depth (ft.): 24.04
DTW (ft.): 11.90
Water Column (ft.): 12.14
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.): 2

Purge Methodology: Peristaltic Low Flow

Water Quality Meter: YSI # C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1333

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1337	14.12	variable	0.5	7.36	9.1	0.73	169.4	4.88	4.48	
	1340	14.20	200	0.6	7.30	9.1	0.72	168.8	4.60	5.53	
	1343	14.38	↑	0.8	7.28	9.2	0.73	168.3	4.43	5.17	↑ rate to ~~str~~ induce flow
	1351	15.69	150	1.5	7.33	8.9	0.74	166.7	4.17	8.32	
	1354	15.80	150	1.6	7.30	8.7	0.74	166.3	3.88	7.13	Go to 3V method
	1400	17.70	500	2.5	7.29	9.6	0.72	163.9	3.21	9.72	
	1407	19.21	500	3.5	7.28	9.9	0.72	160.1	3.38	15.20	1412-~~1408~~-1418 Pump repair
	1419	20.17	500	4.5	7.30	9.9	0.73	98.3	2.88	49.2	
	1424	20.83	500	5	7.29	9.9	0.72	94.2	2.32	50.4	
	1428	21.52	500	5.5	7.27	9.7	0.72	100.3	2.34	37.5	
	1430	21.69	500	5.75	7.29	9.9	0.72	103.9	2.37	33.7	
Post-Purge	1432	21.82	500	6.0	7.29	9.9	0.72	108.8	2.35	35.4	

Remarks: Pump Intake Depth: 23 ft bgs   Control Box Setting (Hz):   Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling: 21.82
Sample Methodology: Low flow
Sample Name: FTP-MW3-0319   QC Sample:
Sample Date/Time: 3/8/19 1435
Sampler / Signature: JH
Filtered Metals Collected: Y / N   Filter Size:
Sample Observations:
Parameters: VOCs, Explosives

ch2m.

RESAMPLE - VOCs

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW3-
Site: FTA
Field Crew: R. CAIRD
Date: 3/23/2019 **Project #:** 679172CH.01.02.DP.04

Well Depth (ft.): 24.04' BTOC
DTW (ft.): 13.38' BTOC
Water Column (ft.): 10.66
Well Diameter (in.): 2
Gal. per ft: 0.163
Well Volume (gal.): 1.74 GAL
WL METER C103091

Purge Methodology: LOW-FLOW PERI PUMP C102516
Water Quality Meter: C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1639	14.15	200	0.15	7.25	10.1	0.51	121.6	7.12	NM	
	1642	14.19	200	0.30	7.26	9.9	0.51	123.6	6.82		
	1645	14.43	200	0.45	7.26	9.8	0.50	126.5	6.88		
	1648	14.62	200	0.60	7.26	9.8	0.50	127.8	6.75		
	1651	14.76	200	0.75	7.27	9.7	0.51	128.6	6.87		
	1654	14.90	200	0.90	7.27	9.8	0.51	129.1	6.70		
Post-Purge											

Remarks: Pump Intake Depth: 19.00' BTOC Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

PUMP ON 1636

NM = NOT MEASURED, SEE INITIAL PURGE LOG

SAMPLING

Depth to Water Before Sampling: 14.90' BTOC
Sample Methodology: PERISTALTIC
Sample Name: FTP-MW3-R0319 QC Sample: —
Sample Date/Time: 3/23/2019 1657
Sampler / Signature: R
Filtered Metals Collected: Y / (N) Filter Size: —
Sample Observations: —
Parameters: VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP - MW 5		Site: IAAAP	
Field Crew: Dora Prado	Purge Methodology:	Date: 3/23/19	Project #:
Well Depth (ft.): 16.73	peri pump		
DTW (ft.): 9.52			
Water Column (ft.):			
Well Diameter (in.): 2 in			
Gal. per ft.: .163	Water Quality Meter:		
Well Volume (gal.):	C-102936	PID: 0.0 ppm	

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

begin @ 1439

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1442	982	175		7.41	10.1	0.70	122.5	5.3	7.52	
	1445	9.97	150		7.34	9.9	0.700	122.7	4.7	3.74	
	1448	10.02	150		7.29	9.7	0.701	122.9	4.7	3.80	
	1451	10.08	150		7.26	9.6	0.700	123.1	4.5	3.96	
	1454	10.09	150		7.25	9.6	0.700	123.4	4.3	4.57	
	1457	10.11	150		7.25	9.6	0.699	123.8	4.2	3.59	
	1500	10.13	150		7.22	9.5	0.699	124.2	4.2	3.01	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @1500
samples collected @1505

SAMPLING

Depth to Water Before Sampling: 10.13 ft

Sample Methodology: low flow peri pump

Sample Name: FTP - MW 5 QC Sample:

Sample Date/Time: 3/23/19

Sampler / Signature: Dora Prado

Filtered Metals Collected: Y (N) Filter Size:

Sample Observations:

Parameters: VOCs

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW6-0
Site: IAAAP
Field Crew:
Date: 3/24/19 Project #:

Well Depth (ft.): 47.94
DTW (ft.): 19.37
Water Column (ft.): 28.57
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.): 4.6
Turbidimeter #C-103314

Purge Methodology: Bladder Pump

Water Quality Meter: YSI #C103142
WL Meter # C-103372
PID # C-103006

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1230

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1236	22.14	variable	0.5	7.23	11.0	0.69	71.5	4.48	5.70	↓ rate to test recharge
	1239	22.30	125	0.6	7.24	11.0	0.681	79.6	4.27	4.11	↑ rate to induce recharge
	1251	30.61	400	1.75	7.30	11.0	0.673	93.4	4.81	3.92	↓ rate to check recharge
	1254	30.75	100	1.8	7.30	10.9	0.672	100.9	4.97	3.71	↑ rate to 400
	1306	37.92	150	3	7.31	10.9	0.673	107.3	4.66	3.47	
	1309	37.94	150	3.1	7.31	10.9	0.673	109.1	4.72	3.03	
	1312	37.97	150	3.2	7.31	10.8	0.673	109.4	4.74	3.10	
Post-Purge											

Remarks: Pump Intake Depth: 45 ft bgs
Control Box Setting (Hz):
Sampling: (Sample at 100-250 ml/min) 150 ml/min

PID ⇒ BZ = 0.0 ppm, HS = 0.0 ppm

SAMPLING

Depth to Water Before Sampling:
Sample Methodology: Bladder Pump
Sample Name: FTP-MW6-0319
QC Sample: MS/MSD
Sample Date/Time: 3/24/19 1315
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: ——
Sample Observations:
Parameters: VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW7		**Site:** FTP IAAAP	
Field Crew: J. Hansen, L. Pride		**Date:** 3/9/19	**Project #:**
Well Depth (ft.): 24.70	Purge Methodology: Peristaltic	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
DTW (ft.): 9.67		2" .163	5" 1.020
Water Column (ft.):		3" .367	6" 1.469
Well Diameter (in.):		4" .653	8" 2.611
Gal. per ft.:	Water Quality Meter: #C-103142		
Well Volume (gal.):			

1053 Start purge

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1058	11.17	variable	0.5	6.89	9.4	0.546	160.1	1.48	4.08	
	1102	11.10	250	0.7	6.90	9.8	0.550	160.4	1.28	3.27	
	1105	11.10	250	0.8	6.91	9.6	0.553	160.2	1.22	1.63	
	1108	11.10	250	1.0	6.93	9.6	0.557	160.0	1.18	2.01	
	1111	11.10	250	1.2	6.93	9.5	0.557	159.7	1.16	1.88	
Post-Purge											

Remarks: Pump Intake Depth: 23 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 250 ml/min

SAMPLING

Depth to Water Before Sampling:

Sample Methodology: Peristaltic

Sample Name: FTP-MW7-0319

QC Sample: —

Sample Date/Time: 3/9/19 1115

Sampler / Signature: [signature]

Filtered Metals Collected: Y / N Filter Size:

Sample Observations:

Parameters: VOCs

1015

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW8		Site: FTP IAAAP	
Field Crew: J. Hansen, L. Prado		Date: 3/9/19	Project #:

Well Depth (ft.): 54
DTW (ft.): 10.15
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Peristaltic

Water Quality Meter: #C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin ~~1128~~ 1148 (9A)

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	Checked initial drawdown was significant so will drop to 25 ft with peristaltic min check again
Initial	1148	20.76	~~100~~ 150	1.5	7.65	9.4	0.544	209.6	7.21	2.52	
	1152	20.80	125	1.6	7.65	8.6	0.546	205.9	7.08	1.73	
	1155	20.78	125	1.7	7.65	8.3	0.544	208.6	6.70	2.30	
	1158	20.76	150	1.8	7.63	8.5	0.544	208.0	6.41	2.39	
	1201	20.75	150	1.9	7.60	8.6	0.547	206.3	6.30	2.20	
	1204	20.75	150	2.0	7.62	8.6	0.547	206.1	6.32	2.17	
Post-Purge											

Remarks: Pump Intake Depth: 50 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 150 ml/min

SAMPLING

Depth to Water Before Sampling: 20.75
Sample Methodology: Peristaltic
Sample Name: FTP-MW8-0319
QC Sample: —
Sample Date/Time: 3/9/19 1205
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations:
Parameters: VOCs

ch2m

Pg 1 of 2

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTA-TT-MW01	Site: IAAAP
Field Crew:	Date: 3/23/19 Project #:

		Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
Well Depth (ft.): 29.42	Purge Methodology: peri pump	2"	.163	5"	1.020
DTW (ft.): 3.15		3"	.367	6"	1.469
Water Column (ft.):		4"	.653	8"	2.611
Well Diameter (in.): 1 inch					
Gal. per ft.:	Water Quality Meter: C-102936				
Well Volume (gal.):		PID: 0.0 ppm			

begin @ 1600

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1603	5.02	200		6.85	10.8	1.15	-70.8	2.5	3.19	
	1606	4.84	150		6.82	10.4	1.13	-73.3	1.6	3.42	
	1609	5.22	150		6.78	10.3	~~1.20~~ 1.09	-71.6	1.2	5.52	
	1612	5.75	125		6.77	10.2	1.07	-69.3	1.0	7.35	
	1615	6.12	100		6.78	10.2	1.07	-65.3	1.0	~~15.1~~	15.5
	1618	6.47	100		6.78	10.3	1.06	-64.5	0.9	15.8	
	1621	6.81	100		6.78	10.3	1.05	-62.0	0.9	18.2	
	1623	7.07	75		6.79	10.4	1.05	-60.8	0.9	13.3	
	1625	7.21	75		6.79	10.4	1.05	-60.0	0.9	16.0	
	1628	7.46	60		6.80	10.5	1.05	-58.3	0.9	11.1	
	1631	7.69	60		6.80	10.5	1.04	-58.1	0.9	10.4	
Post-Purge	1634	7.93	50		6.80	10.8	1.04	-56.4	0.8	9.11	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

SAMPLING

Depth to Water Before Sampling: 8.22 ft

Sample Methodology: peri pump

Sample Name: FTA-TT-MW01 QC Sample:

Sample Date/Time: 3/23/19 1645

Sampler / Signature: Lora Pride

Filtered Metals Collected: Y / N Filter Size:

Sample Observations:

Parameters: VOCs and RCRA metals

ch2m:

pg 2 of 2

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTA-TT-MW01		Site: IAAAP	
Field Crew: Lora Pride		Date: 3/23/19	Project #:
Well Depth (ft.): 29.42	Purge Methodology: Peri pump	Diameter / Gal. Per Foot	Diameter / Gal. Per Foot
DTW (ft.): 3.15		2" / .163	5" / 1.020
Water Column (ft.):		3" / .367	6" / 1.469
Well Diameter (in.): 1in		4" / .653	8" / 2.611
Gal. per ft.:	Water Quality Meter: C-102936		
Well Volume (gal.):			

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1637	8.08	50		6.80	10.8	1.04	-54.0	0.8	12.1	
	1640	8.22	50		6.82	10.9	1.04	-50.2	0.8	7.71	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable @ 1640
samples collected @ 1645

SAMPLING

Depth to Water Before Sampling: 8.22 ft

Sample Methodology: low flow peri pump

Sample Name: FTA-TT-MW01-0319 QC Sample:

Sample Date/Time: 3/23/19 1645

Sampler / Signature: Lora Pride

Filtered Metals Collected: Y / N Filter Size:

Sample Observations:

Parameters: VOCs and RCRA metals

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTA-TT-MW-02

Site: IAAAP

Field Crew: Lora Prodi

Date: 3/21/19 Project #:

Well Depth (ft.): 32.07

DTW (ft.): 3.85

Water Column (ft.):

Well Diameter (in.): 1 inch

Gal. per ft.:

Well Volume (gal.):

Purge Methodology: low flow peri-pump

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	SP Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	12:25	4.90	150		5.91	9.7	0.616	-52.7	0.68	147	hydrocarbon
	1228	4.97	200		6.00	9.6	0.880	-78.1	0.40	62.0	smell
	1231	5.06	200		5.74	10.1	1.57	-77.8	0.34	137.0	
	1234	5.07	200		5.61	10.1	2.52	-75.7	0.33	43.9	
	1237	5.01	200		5.50	10.2	2.48	-72.6	0.30	33.9	
	1240	4.80	150		5.45	10.4	2.83	-72.1	0.31		
	1243	4.94	150		5.46	10.2	4.26	-72.0	0.23	19.0	
	1249	4.94	150		5.43	9.8	4.44	-73.7	0.19	15.5	
	1251	4.93	150		5.44	9.5	4.49	-74.4	0.17	15.1	
	1253	4.92	150		5.44	10.0	4.63	-75.1	0.14	12.6	
	1256	4.96	150		5.44	10.2	4.77	-75.3	0.16	13.4	
Post-Purge	1259	4.98	160		5.44	10.0	4.73	-76.6	0.14	11.8	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling 1300 (Sample at 100-250 ml/min)

parameters stable at 1259
samples collected @ 1300

SAMPLING

Depth to Water Before Sampling: 4.98 ft

Sample Methodology: low flow peri pump

Sample Name: FTA-TT-MW-02-0319 QC Sample:

Sample Date/Time: 3/21/19 1300

Sampler / Signature: Lora Prodi

Filtered Metals Collected: Y / N Filter Size:

Sample Observations:

Parameters: VOCs and RCRA metals

PID: 0.0 ppm

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet Pg 1 of 2

Well Number: FTA-TT-MW-03
Site: IAAAP
Field Crew: Lora Prodi
Date: 3/21/19 Project #:

Well Depth (ft.): 29.39 ft
DTW (ft.): 3.50 ft
Water Column (ft.):
Well Diameter (in.): 1 inch
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: low flow peri pump

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

flush mount

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	hydrocarbon smell
Initial	1355	4.77	200		6.45	10.2	1.18	-61.5	0.48	84.8	
	1358	4.76	200		6.49	10.0	1.13	-70.1	0.35	21.2	
	1401	5.21	160		6.48	9.5	1.10	-69.7	0.42	21.2	
	1404	5.62	160		6.49	9.5	1.04	-64.0	0.89	18.6	
	1407	6.16	160		6.53	9.5	0.94	-51.7	~~4.10~~ 0.95	14.3	
	1410	6.79	150		6.57	9.3	0.88	-37.1	3.04	13.5	
	1413	7.69	200		6.57	9.4	0.84	-18.0	3.45	11.4	
	1416	8.69	200		6.57	9.4	0.87	-12.1	3.06	11.3	
	1419	9.45	150							12.3	
	1422	~~10.01~~ 10.28	150		6.45	9.7	0.95	-8.9	1.35	7.76	
	1425	11.61	150		6.40	9.7	0.99	-7.9	1.07	8.40	
Post-Purge	1428	12.35	150		6.39	10.1	1.06	-35.0	0.84	10.7	
	Remarks:	Pump Intake Depth:				Control Box Setting (Hz):				Sampling: (Sample at 100-250 ml/min)	
	1431	13.22	140		6.42	10.4	1.06	-42.2	0.80	9.53	
	1435	13.69	100		6.43	10.7	1.07	-43.0	0.71	11.6	
	1438	13.99	100		6.44	10.9	1.08	-44.5	0.66	11.6	
	1441	14.24	100		6.44	11.1	1.08	-48.2	0.60	10.4	
	1444	14.52	100		6.45	11.0	1.09	-53.6	0.57	8.35	
	1447	14.69	100		6.47	10.9	~~SAMPLING~~ 1.10	-59.6	0.57	7.46	

Depth to Water Before Sampling: 16.08 ft
Sample Methodology: low flow peri pump
Sample Name: FTA-TT-MW-03-0319 QC Sample:
Sample Date/Time: 3/21/19 1515
Sampler / Signature: Lora Prodi
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: VOCs and RCRA metals

PID: 0.0 ppm

1450	14.86	100		6.48	10.5	1.09	-63.8	0.54	8.06
1453	15.05	100		6.50	10.7	1.09	-67.4	0.50	7.25

ch2m:

Pg 2 of 2

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTA-TT-MW-03		Site: IAAAP	
Field Crew: LORA PRIDE		Date: 3/21/19	Project #:

* Well Depth (ft.):
* DTW (ft.):
Water Column (ft.): SEE PAGE 1
Well Diameter (in.):
Gal. per ft.:
Well Volume (gal.):

Purge Methodology:

Water Quality Meter:

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1456	15.24	100		6.50	10.6	1.07	-67.2	0.51	6.55	
	1459	15.45	100		6.52	10.8	1.04	-69.6	0.46	8.71	
	1503	15.64	100		6.54	11.0	1.04	-71.4	0.45	9.35	
	1505	15.77	100		6.55	10.9	1.03	-73.7	0.45	10.8	
	1508	15.90	100		6.58	11.2	1.02	-76.3	0.43	12.0	
	1510	16.01	100		6.60	10.7	1.02	-78.1	0.43	11.4	
	1511	16.08	100		6.59	10.6	1.01	-78.3	0.42	11.1	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable at 1511
samples collected at 1515

SAMPLING

Depth to Water Before Sampling: 16.08 ft
Sample Methodology: low flow peri pump
Sample Name: FTA-TT-MW-03 QC Sample:
Sample Date/Time: 3/21/19 1515
Sampler / Signature: Lora Pride
Filtered Metals Collected: Y N Filter Size:
Sample Observations:
Parameters: VOCs and RCRA metals

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTA-TT-MW-04	Site: IAAAP
Field Crew: Jora Pride	Date: 3/21/19 Project #:

Well Depth (ft.): 34.16
DTW (ft.): 5.00
Water Column (ft.):
Well Diameter (in.): 1 inch
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: low flow peri pump

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

PID → 0.0 ppm

Field Parameters

	Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1630	5.38	250		6.60	10.6	0.450	39.3	0.85	78.2	
	1633	5.38	250		6.58	10.6	0.433	47.6	0.46	52.9	
	1636	5.38	250		6.58	10.5	0.438	1.5	0.33	39.7	
	1639	5.38	250		6.55	10.4	0.477	-27.6	0.25	17.1	
	1642	5.38	250		6.50	10.4	0.515	-40.0	0.25	11.0	
	1645	5.39	250		6.48	10.4	0.550	-48.6	0.20	8.76	
	1648	5.39	250		6.46	10.4	0.577	-54.1	0.19	10.3	
	1651	5.39	250		6.46	10.4	0.600	-58.3	0.18	8.13	
	1654	5.39	250		6.43	10.4	0.629	-62.5	0.16	7.36	
	1657	5.39	250		6.43	10.4	0.650	-66.0	0.15	5.58	
	1700	5.39	250		6.41	10.4	0.662	-68.6	0.17	4.80	
Post-Purge	1703	5.39	250		6.42	10.4	0.674	-70.7	0.14	3.96	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

1705	5.39	250		6.42	10.4	0.689	-72.9	0.15	4.56
1708	5.39	250		6.40	10.4	0.700	-74.6	0.14	3.15
1711	5.39	250		6.41	10.4	0.710	-76.9	0.14	3.35

parameters stable @ 1711
samples collected @ 1715

SAMPLING

Depth to Water Before Sampling: 5.39
Sample Methodology: low flow peri pump
Sample Name: FTA-TT-MW-04-0319 QC Sample:
Sample Date/Time: 3/21/19
Sampler / Signature: Jora Pride
Filtered Metals Collected: Y (N) Filter Size:
Sample Observations:
Parameters: VOCs and RCRA metals

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTA-TT-MW05		Site: FTA JAAAP	
Field Crew: Joshua Hansen		Date: 3/21/19	Project #:
Well Depth (ft.): 32.30	Purge Methodology: Peristaltic	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 3.87			
Water Column (ft.):			
Well Diameter (in.): 1"			
Gal. per ft.:	Water Quality Meter: YSI # C103142		
Well Volume (gal.):			

Begin 1611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1614	4.01	variable	0.4	6.74	10.5	1.33	22.5	1.22	19.5	
	1617	4.00	200	0.6	6.72	10.2	0.79	3.8	0.66	12.3	
	1620	4.00	200	0.8	6.74	10.1	0.79	-4.9	0.58	9.87	
	1623	4.00	200	1.0	6.78	10.2	0.79	-7.4	0.54	9.81	
	1626	4.00	200	1.2	6.77	10.2	0.79	-5.8	0.46	10.12	
	1629	4.00	200	1.4	6.81	10.2	0.79	-5.9	0.48	9.97	
Post-Purge											

Remarks: Pump Intake Depth: 30 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min)

PID = 0.0 ppm BZ & Headspace

SAMPLING

Depth to Water Before Sampling: 4.00

Sample Methodology: Peristaltic

Sample Name: FTA-TT-MW-05-0319 QC Sample: FTA-TT-MW-F05-0319

Sample Date/Time: 3/21/19 1630

Sampler / Signature: [signature]

Filtered Metals Collected: Y N Filter Size: —

Sample Observations: Clear

Parameters: Explosives, metals, VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: ~~WBP MW9~~ TT-MW06 (9H)		Site: IAAAP	
Field Crew: Justina Hansen		Date: 3/22/19	Project #:

Well Depth (ft.): 7.50
DTW (ft.): 4.90
Water Column (ft.): 2.60
Well Diameter (in.): 1
Gal. per ft.: 0.041
Well Volume (gal.): 0.2

Purge Methodology: Peristaltic

Water Quality Meter: YSI #C103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

1" = 0.041

Begin 1630

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1633	5.81	100	0.1	6.90	6.7	0.683	58.2	10.60	7.31	
	1636	6.37	100	0.2	6.72	6.4	0.681	87.1	8.22	5.42	
1641	~~1639~~	7.05	75	0.30	6.67	7.0	0.728	88.3	6.43	6.01	
	1644	7.39	75	0.4	6.65	7.1	0.781	91.2	6.31	21.7	
	1646	—	Dry, other piezometers recharged shortly - will give this one 10-15 minutes and see if sample can be collected.								
		—	Only recharged 75 ml in 15 minutes. Will come back tomorrow.								
3/23/19	0945	5.20	sampled for explosives and RCRA metals								
3/24/19	0945	sampled for VOC									
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

PID: BZ=0.0ppm Headspace = 0.0ppm

SAMPLING

Depth to Water Before Sampling: —
Sample Methodology: PERI
Sample Name: WBP-TT-MW-06-0319 QC Sample: —
Sample Date/Time: 3/23 - 3/24
Sampler / Signature: LP
Filtered Metals Collected: Y / (N) Filter Size:
Sample Observations: —
Parameters: Explosives, VOCs, Metals

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: FTP-MW4		Site: FTA JAAAP	
Field Crew: Jestina Hansen		Date: 3/21/19	Project #:

Well Depth (ft.): 62.35
DTW (ft.): 17.34
Water Column (ft.): 45.01
Well Diameter (in.): 2
Gal. per ft.: 0.163
Well Volume (gal.): 7.34

Purge Methodology: Bladder Pump Low Flow

Water Quality Meter: YSI # C-103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 0843 1560

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0848	17.53	variable	0.5	7.04	10.5	0.79	0.7	3.80	17.0'	
	0852	17.68	100	0.6	7.00	11.3	0.79	-9.3	0.79	9.82	Insufficient recharge, ↑ flow rate to induce recharge
	0907	24.82	450	1.5	7.00	11.1	0.83	-4.7	0.80	7.11	
	0911	25.03	100	1.6	7.03	11.1	0.79	-1.3	0.81	5.43	
	0932	34.70	450	3.75	7.65	11.3	0.559	-77.1	6.98	8.22	
	0950	47.25	100	5.75	7.65	11.2	0.564	-81.0	7.00	6.03	
	0953	47.28	100	5.8	7.65	11.0	0.561	-81.2	6.70	6.11	
	0956	47.35	100	5.9	7.65	11.0	0.561	-81.2	6.86	7.08	
	0959	47.40	100	6.0	7.65	10.9	0.561	-81.3	6.82	5.98	
Post-Purge											

Remarks: Pump Intake Depth: 56 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 100 ml/min

PID: BZ = 0.0 ppm Headspace = 0.1 ppm

SAMPLING Sample complete 1120

Depth to Water Before Sampling: 47.40
Sample Methodology: Bladder
Sample Name: FTP-MW4-0319 QC Sample: MS/MSD
Sample Date/Time: 3/21/19 1000
Sampler / Signature: [signature]
Filtered Metals Collected: Y / (N) Filter Size:
Sample Observations:
Parameters: Explosives, VOCs, metals

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-58	Site: IAAAP FTA
Field Crew: Lora Pndi	Date: 3/9/19 Project #:

Well Depth (ft.): 23.13
DTW (ft.): 4.90 18.23
Water Column (ft.):
Well Diameter (in.): 2 in
Gal. per ft.: .163
Well Volume (gal.): 2.97

Purge Methodology: peri pump low flow

Water Quality Meter: C-103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500	.5	+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1544	6.29	225	.5	6.57	6.5	0.500	126.1	4.12	25.1	
	1548	6.76	240		6.54	6.7	0.479	126.4	3.71	6.04	
	1552	7.30	190		6.53	6.5	0.462	125.9	3.55	3.43	
	1556	7.10	200		6.52	6.6	0.438	126.1	3.60	3.42	
	1559	7.10	200		6.52	6.6	0.428	126.4	3.62	2.44	
	1604	7.14	200		6.53	6.5	0.416	126.7	3.65	2.64	
	1605	7.18	200		6.53	6.5	0.415	126.3	3.59	3.53	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

begin low flow @ 1539

pin

1605 parameters stable - sampling @ 1610

SAMPLING

Depth to Water Before Sampling: 4.90
Sample Methodology: peri pump
Sample Name: JAW-58-0319 QC Sample:
Sample Date/Time: 3/9/19 1610
Sampler / Signature: Lora Pndi
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: metals and VOCs

ch2m

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-59		Site: FTA	
Field Crew: J. Hansen		Date: 3/9/19	Project #:
Well Depth (ft.): 30.50	Purge Methodology: Peristaltic Low-Flow		
DTW (ft.): 11.82			
Water Column (ft.):			
Well Diameter (in.): 2			
Gal. per ft.:	Water Quality Meter: #C103142		
Well Volume (gal.):			

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin Purge 1437

Field Parameters

	Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	~~1430~~ 1442	13.28	variable	0.5	6.88	9.8	0.646	198.3	8.22	16.2	
	1445	13.30	200	0.6	6.86	9.4	0.644	199.3	7.80	9.72	
	1450	13.33	200	0.8	6.87	9.3	0.645	199.4	7.65	8.00	
	1453	13.34	200	1.0	6.87	9.4	0.645	199.4	7.56	9.98	
	1456	13.36	200	1.1	6.87	9.5	0.646	199.5	7.52	10.00	
Post-Purge											

Remarks: Pump Intake Depth: 28 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 200 ml/min

SAMPLING

Depth to Water Before Sampling: 13.36

Sample Methodology: Peristaltic

Sample Name: JAW-59-0319

QC Sample: —

Sample Date/Time: 3/9/19 1500

Sampler / Signature: [signature]

Filtered Metals Collected: Y/(N) Filter Size: —

Sample Observations:

Parameters: Explosives, VOC, Metals

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-60		Site: 3/21/19 IAAAP	
Field Crew: Joshua Hansen		Date:	Project #:

Well Depth (ft.): 37.07
DTW (ft.): 13.00
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Peristaltic

Water Quality Meter: YSI # C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1139

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1144	15.55	variable	0.5	7.36	11.4	0.80	107.8	0.77	4.83	
	1147	15.40	150	0.6	7.10	10.8	0.85	101.6	0.86	4.77	
	1150	15.41	200	0.8	7.14	10.8	0.84	99.1	0.83	5.01	
	1153	15.41	200	0.9	7.11	10.8	0.80	95.9	0.67	4.32	
	1156	15.42	200	1.0	7.10	10.8	0.80	94.4	0.61	3.35	
	1159	15.42	200	1.2	7.11	10.6	0.81	94.0	0.59	3.81	
Post-Purge											

Remarks:

Pump Intake Depth: 35 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 200 ml/min

PID: BZ = 0.0ppm Headspace = 0.2 ppm

SAMPLING

Depth to Water Before Sampling: 15.42
Sample Methodology: Peristaltic
Sample Name: JAW-60-0319 QC Sample: —
Sample Date/Time: 3/21/19 1200
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations:
Parameters: Metals VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW - 61
Site: IAAAP
Field Crew: Lora Pride
Date: 3/21/19 Project #:

Well Depth (ft.): 16.20 ft
DTW (ft.): 8.0 ft
Water Column (ft.):
Well Diameter (in.): 2 in.
Gal. per ft.: .163
Well Volume (gal.):

Purge Methodology: low flow peri pump

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	0835	8.45	150		6.60	7.5	0.505	275.6	7.24	53.6	
	0840	8.68	150		6.65	7.4	0.501	269.8	6.61	49.4	
	0843	8.77	150		~~6.59~~ 6.64	7.4	0.498	267.2	6.70	43.1	
	0845	8.85	150		6.64	7.5	0.497	265.7	6.33	38.2	
	0848	8.93	150		6.66	7.6	0.501	263.9	6.25	33.9	
	0851	9.25	250		6.64	8.0	0.495	262.4	6.40	27.8	
	0853	9.61	200		6.63	7.9	0.493	262.1	6.36	23.5	
	0857	9.74	200		6.64	7.7	0.491	261.8	6.58	21.2	
	0900	9.85	200		6.64	7.8	0.498	261.5	6.41	18.6	
	0903	9.93	200		6.62	7.8	0.488	261.2	6.29	16.1	
	0905	10.00	200		6.63	7.7	0.486	261.2	6.36	14.0	
Post-Purge	0908	10.06	200		6.61	7.8	0.483	261.1	6.26	14.8	

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

PID reading 0.0 ppm

0911	10.12	200	6.61	7.9	0.483	261.1	6.23	13.2
0913	10.15	200	6.59	7.8	0.483	261.1	6.26	10.0
0914	10.17	200	6.60	7.8	0.482	261.2	6.34	9.57

SAMPLING

Depth to Water Before Sampling: 10.06 ft
Sample Methodology: low flow peri pump
Sample Name: JAW-61-0319 QC Sample:
Sample Date/Time: 03/21/19 0920
Sampler / Signature: Lora Pride
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: VOCs

parameters stable @ 0914
samples collected at 0920

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-62
Site: IAAAP
Field Crew: Lina Pnd's
Date: 3/21/19 Project #:

Well Depth (ft.): 17.12 ft
DTW (ft.): 8.07 ft
Water Column (ft.):
Well Diameter (in.): 2 in
Gal. per ft.: .163
Well Volume (gal.):

Purge Methodology: low flow peri pump

Water Quality Meter: C-10340

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Sp Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1000	8.24	200		6.95	8.5	0.417	251.6	4.76	13.3	
	1005	8.49	200		6.88	8.4	0.416	248.1	4.23	13.6	
	1008	8.59	200		6.86	8.1	0.416	246.2	4.18	10.3	
	1011	8.69	200		6.86	8.2	0.413	244.5	4.09	10.0	
	1013	8.76	200		6.85	8.0	0.416	243.7	4.06	9.78	
	1016	8.81	200		6.85	8.0	0.416	242.7	4.03	6.38	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

readings stable @ 1016
samples taken @ 1020

SAMPLING

Depth to Water Before Sampling: 8.81 ft
Sample Methodology: low flow peri pump
Sample Name: JAW-62-0319 QC Sample:
Sample Date/Time: 03/21/19 1020
Sampler / Signature: Lina Pnde
Filtered Metals Collected: Y / N (circled N) Filter Size:
Sample Observations:
Parameters: VOCs and RCRA metal

PID 0.0 ppm

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-63	Site: 3/21/19 (JD) IAAAP
Field Crew: Lora Prado	Date: 3/21/19 Project #:

Well Depth (ft.): 18.21ft
DTW (ft.): 7.48ft
Water Column (ft.):
Well Diameter (in.): 2in
Gal. per ft.: .163
Well Volume (gal.):

Purge Methodology: low flow peri pump

Water Quality Meter: C-103140

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1104	7.69	200		6.95	9.4	0.660	245.6	3.40	12.4	
	1107	7.85	200		6.88	9.3	0.657	239.3	2.19	8.64	
	1110	7.92	200		6.89	9.0	0.659	236.7	2.01	7.88	
	1113	7.96	200		6.89	9.0	0.658	234.2	1.93	7.32	
	1115	8.00	200		6.89	9.1	0.659	232.1	1.89	6.86	
	1118	8.01	200		6.88	9.1	0.657	230.6	1.89	9.08	
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

parameters stable at 1118
samples taken at 1120

SAMPLING

Depth to Water Before Sampling: 8.01 ft
Sample Methodology: low flow peri pump
Sample Name: JAW-63-0319 QC Sample:
Sample Date/Time: 03/21/19 1120
Sampler / Signature: Lora Prado
Filtered Metals Collected: Y (N) Filter Size:
Sample Observations:
Parameters: explosives, VOCS and RCRA metals

PID: 0.0 ppm

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-68	Site: IAAAP
Field Crew: Lora Prado	Date: 3/24/19 Project #:

Well Depth (ft.): 16.64
DTW (ft.): 10.97
Water Column (ft.):
Well Diameter (in.): 2in
Gal. per ft.: .163
Well Volume (gal.):

Purge Methodology: low-flow peri pump

Water Quality Meter:

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

PID: 0.0 ppm

begin @ 1018

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1021										
Post-Purge											

Remarks: Pump Intake Depth: Control Box Setting (Hz): Sampling: (Sample at 100-250 ml/min)

pump in well - cannot be removed because casing is bent (photo)
* pump ran dry - cannot sample this well *

NO SAMPLE COLLECTED.

SAMPLING

Depth to Water Before Sampling:
Sample Methodology: ~~peri pump~~
Sample Name: ~~JAW-68-0319~~ (LP) QC Sample:
Sample Date/Time: ~~3/24/19~~
Sampler / Signature: ~~Lora Prado~~
Filtered Metals Collected: Y / N Filter Size:
Sample Observations:
Parameters: ~~explosives and VOCs (+MS/MSDS)~~

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: JAW-80		Site: PTA	
Field Crew: J Hansen		Date: 3/09/19	Project #:
Well Depth (ft.): 28 (installed depth 27)	Purge Methodology: Peristaltic	Diameter / Gal. Per Foot: 2" .163; 3" .367; 4" .653	Diameter / Gal. Per Foot: 5" 1.020; 6" 1.469; 8" 2.611
DTW (ft.): 8.02			
Water Column (ft.):			
Well Diameter (in.):			
Gal. per ft.:	Water Quality Meter: #C103140		
Well Volume (gal.):			

Begin purge 1252

Field Parameters

	Time	DTW (toc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1258	8.25	variable	0.5	6.56	9.3	0.574	112.0	3.80	171	
	1302	8.25	350	0.8	6.60	9.3	0.573	116.2	3.72	81.5	
	1306	8.25	350	1.1	6.67	9.4	0.575	122.1	3.50	45.9	
	1310	8.25	350	1.4	6.69	9.4	0.574	127.6	3.42	41.6	
	1313	8.25	350	1.7	6.72	9.5	0.580	129.0	3.28	34.8	
	1316	8.25	350	2.0	6.72	9.5	0.581	130.6	3.20	28.8	
	1319	8.25	350	2.3	6.72	9.5	0.579	131.4	3.15	17.8	
	1322	8.25	350	2.6	6.74	9.5	0.582	132.5	3.03	16.9	
	1325	8.25	350	2.9	6.74	9.5	0.581	132.3	3.00	8.8	
Post-Purge											

Remarks: Pump Intake Depth: 20 ft | Control Box Setting (Hz): | Sampling: (Sample at 100-250 ml/min) 250 ml/min

SAMPLING

Depth to Water Before Sampling: 8.25

Sample Methodology: Peristaltic

Sample Name: JAW-80-0319 | QC Sample: FJAW-80-0319, MS/MSD

Sample Date/Time: 3/9/19 1325

Sampler / Signature:

Filtered Metals Collected: Y / (N) Filter Size:

Sample Observations:

Parameters: VOCs, RCRA Metals, Explosives

ch2m.

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: M-01	Site: TAAAF FTA
Field Crew: Joshua Hansen	Date: 3/24/19 Project #:

Well Depth (ft.): 20.42
DTW (ft.): 9.50
Water Column (ft.):
Well Diameter (in.): 2
Gal. per ft:
Well Volume (gal.):
Turbidimeter #C103314

Purge Methodology: Peristaltic
WL Meter - C103372
Water Quality Meter: YSI # C103142
PID # C103006

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1413

Field Parameters

	Time	DTW (btc)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1418	10.20	varied	0.25	6.42	9.0	0.643	156.3	4.40	33.8	
	1421	10.20	150	0.4	6.41	8.7	0.642	161.7	4.06	29.5	
	1424	10.20	150	0.5	6.40	8.8	0.644	164.2	4.00	20.5	
	1427	10.20	150	0.7	6.41	8.8	0.649	166.0	3.97	10.2	
	1430	10.20	150	0.8	6.44	8.8	0.654	167.4	3.87	11.0	
	1433	10.20	150	0.9	6.43	8.8	0.659	167.5	3.83	10.0	
Post-Purge											

Remarks: Pump Intake Depth: 19 ft bgs

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 150 ml/min

SAMPLING

Depth to Water Before Sampling: 10.20
Sample Methodology: Peristaltic
Sample Name: M-01-0319
QC Sample: —
Sample Date/Time: 3/24/19 1435
Sampler / Signature:
Filtered Metals Collected: Y / (N) Filter Size: —
Sample Observations:
Parameters: VOCs

ch2m:

Low-Flow Groundwater Sampling: Field Data Sheet

Well Number: SA-99-1		Site: FAAAP	
Field Crew: Justin Hansen		Date: 3/21/19	Project #:

Well Depth (ft.): 30
DTW (ft.): 3.50
Water Column (ft.): 26.50
Well Diameter (in.): 6
Gal. per ft.:
Well Volume (gal.):

Purge Methodology: Peristaltic

Water Quality Meter: YSI # C103142

Diameter	Gal. Per Foot	Diameter	Gal. Per Foot
2"	.163	5"	1.020
3"	.367	6"	1.469
4"	.653	8"	2.611

Begin 1244

Field Parameters

	Time	DTW (tic)	Flow Rate (ml/min)	Total Volume (gal)	pH (Std. Units)	Temp (°C)	Cond. (mS/cm)	ORP (mV)	D.O. [Surface] (mg/l)	Turbidity (NTU)	Color/Odor
	Stabilization	< 0.3'	Purge at 200-500		+/- 0.1		+/- 3 %	+/- 10 mV	+/- 10%	+/- 10%	
Initial	1249	3.86	variable	0.5	6.66	9.7	1.26	-109.3	0.98	2.16	Moderately strong fuel odor
	1252	3.88	125	0.6	6.67	9.6	1.26	-110.4	0.79	2.32	Lt. amber, moderate odor
	1255	3.90	125	0.7	6.67	9.9	1.26	-110.9	0.71	1.79	" "
	1258	3.94	125	0.8	6.68	9.9	1.26	-111.4	0.60	1.81	" "
	1301	3.98	125	0.9	6.68	9.6	1.26	-111.8	0.57	1.71	" "
	1304	3.41	125	1.0	6.68	9.6	1.26	-111.7	0.55	2.00	
Post-Purge											

Remarks: Pump Intake Depth: 27 Ft

Control Box Setting (Hz):

Sampling: (Sample at 100-250 ml/min) 125 mL/min

Surface of water column looks foamy. Reddish brown condensation above water column.

PID: BZ=0.0 ppm Headspace = 0.0 ppm

SAMPLING

Depth to Water Before Sampling: 3.98
Sample Methodology: Peristaltic
Sample Name: SA-99-1
QC Sample: —
Sample Date/Time: 3/21/19 1305
Sampler / Signature: [signature]
Filtered Metals Collected: Y / N Filter Size: —
Sample Observations: ~~Clear~~ amber
Parameters:

Appendix D
Waste Documentation

7Q 1806443099

BILL OF LADING/MANIFEST	1. Shipper's US EPA ID No. (If Applicable) None Required	Document No. IO2824-01	2. Page 1 of 1

3. Shipper's Name and Mailing Address: Iowa Army Ammunition Plant, 17571 DMC Highway 79, Middletown IA 52638

4. Shipper's Phone (404) 414-2505

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
Clean Harbors Environmental Services Inc	MAD039322250	(781) 792-5000

7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone

9. Designated Facility Name and Site Address	10. US EPA ID Number	C. Facility's Phone
Des Moines County Regional Landfill, 13758 Washington Rd, West Burlington IA 52655	None Required	(319) 753-8758

	HM	11. Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a.		Non Hazardous, Non DOT Regulated (Soil)	30	DM	12000	P.
b.						
c.						
d.						

SHIPPER

15. Special Handling Instruction and Additional Information

A- 295WA2518

Emergency Phone # (800) 483-3718

Generator: Iowa Army Ammunition Plant

USE 16A OR 16B

16a. US DOT HAZARDOUS MATERIALS SHIPPER'S CERTIFICATION: "This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Printed/Typed Name | Signature required here if US DOT regulated | Month | Day | Year

16b. NON-REGULATED SHIPPER'S CERTIFICATION: I certify the materials described above on this form are not subject to federal regulations for Transportation or Disposal.

Printed/Typed Name: X Kellie Orth | Sign here if material is not DOT regulated: Kellie Orth | Month 12 | Day 20 | Year 18

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Travis Sargent | Signature: T S | Month 12 | Day 20 | Year 18

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month | Day | Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of materials covered by this form except as noted in Item 19.

Printed/Typed Name | Signature | Month | Day | Year

24 HR EMERGENCY # 800-468-1760 (SAFETY-KLEEN)

ORIGINAL-RETURN TO GENERATOR

FORM NO. 01-90291 (03/2015)

BILL OF LADING/MANIFEST	1. Shipper's US EPA ID No. (If Applicable) None Required	Document No. IO2824-02	2. Page 1 of 1

3. Shipper's Name and Mailing Address Iowa Army Ammunition Plant ATTN Kelli Orth
17571 DMC Highway 79
Middletown IA 52638

4. Shipper's Phone (404) 414-2505 319-572-1218

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
Clean Harbors Environmental Services, Inc	MAD039322250	(781) 792-5000
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone
9. Designated Facility Name and Site Address Des Moines County Regional Landfill 13758 Washington Rd West Burlington IA 52655	10. US EPA ID Number None Required	C. Facility's Phone (319) 753-8758

	HM	11. Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a.		Non Hazardous, Non DOT Regulated (Soil)	17	DM	8500	P
b.						
c.						
d.						

SHIPPER

15. Special Handling Instruction and Additional Information

A- 29SWA2518

Emergency Phone # (800) 483-3718
Generator: Iowa Army Ammunition Plant

A

USE 16A OR 16B

16a. US DOT HAZARDOUS MATERIALS SHIPPER'S CERTIFICATION: "This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Printed/Typed Name	Signature required here if US DOT regulated	Month	Day	Year

16b. NON-REGULATED SHIPPER'S CERTIFICATION: I certify the materials described above on this form are not subject to federal regulations for Transportation or Disposal.

Printed/Typed Name	Sign here if material is not DOT regulated	Month	Day	Year
X William Hodge	[signature]	12	21	18

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Travis Sargent	[signature]	12	21	18

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of materials covered by this form except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

24 HR EMERGENCY # 800-468-1760 (SAFETY-KLEEN)

ORIGINAL-RETURN TO GENERATOR

FO

Site Address: 17571 DMC Highway 79
Middletown,IA 52638

SC PPW 6/1/2020

WORK ORDER NO. 7Q 2004068588

1328830

DOCUMENT NO.

STRAIGHT BILL OF LADING

TRANSPORTER 1 Clean Harbors Environmental Services, Inc. VEHICLE ID #

EPA ID # MAD039322250 TRANS. 1 PHONE (781) 792-5000

TRANSPORTER 2 VEHICLE ID #

EPA ID # TRANS. 2 PHONE

DESIGNATED FACILITY Spring Grove Resource Recovery Inc.		SHIPPER ATTN:Amanda Smith Iowa Army Ammunition Plant	
FACILITY EPA ID # OHD000816629		SHIPPER EPA ID # NONEREQUIRED	
ADDRESS 4879 Spring Grove Avenue		ADDRESS 17571 DMC Highway 79 Attn: Amanda Smith	
CITY Cincinnati	STATE OH ZIP 45232	CITY Middletown	STATE IA ZIP 52638

CONTAINERS NO. & SIZE	TYPE	HM	DESCRIPTION OF MATERIALS	TOTAL QUANTITY	UNIT WT/VOL
20X55	DM		A NON HAZARDOUS, NON D.O.T. REGULATED, (SOIL/DEBRIS)	8000	P
2XFBIN	CF		B NON HAZARDOUS, NON D.O.T. REGULATED, (SOIL/DEBRIS)	1000	P
			C.		
			D.		
			E.		
			F.		
			G.		
			H.		

SPECIAL HANDLING INSTRUCTIONS EMERGENCY PHONE #: (800) 483-3718 GENERATOR: Iowa Army Ammunition Plant
A.CH1761031 B.CH1761031

SHIPPERS CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

	PRINT	SIGN	DATE
SHIPPER	Amanda Smith		8-20-20
TRANSPORTER 1	Alvin TRUSTY		8-20-20
TRANSPORTER 2			
RECEIVED BY			

1

Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material.

CHI 107

Appendix E
Survey Data

Appendix E

Survey Data—East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Well Designation	Northing	Easting	PVC Elevation	Ground Elevation
JAW-06R	302378.415	2278574.065	679.03	676.65
EBP-MW7	301758.441	2277525.304	673.801	671.417
EBP-MW9	301385.567	2277888.069	672.297	669.61
EBP-MW17	301212.629	2277119.48	640.179	637.453
EBP-MW13	301569.504	2277121.635	666.929	664.388
EBP-MW16	301962.704	2277104.091	667.729	665.253
EBP-MW15	302295.669	2277531.506	687.909	685.012

Notes:

Coordinates shown are based on Iowa South Coordinate System (NAD83).

Elevations shown are based on NAVD88 vertical datum.

Appendix E

Survey Data—West Burn Pads Area

Iowa Army Ammunition Plant, Middletown, Iowa

Well Designation	Northing	Easting	PVC Elevation	Ground Elevation
WBP-MW6	301715.192	2276112.53	664.707	661.859
WBP-MW8	301642.997	2276256.38	667.331	664.586
WBP-MW9	301715.584	2276209.938	658.404	655.758
WBP-TTMW-01	301761.116	2276497.887	646.3	646.43
WBP-TTMW-02	301722.249	2276509.224	647.53	647.61
WBP-TTMW-03	301736.358	2276407.057	650.07	650.28
WBP-TTMW-04	301737.549	2276334.361	654.32	654.46
WBP-TTMW-05B	301718.849	2276180.833	656.56	656.61
WBP-TTMW-06	301742.092	2276103.581	659.41	659.84
WBP-TTMW-08	301763.69	2276292.069	652	652.3
WBP-TTMW-10	301756.897	2276184.15	653.65	654.09
WBP-TTMW-11	301744.46	2276109.312	658.97	659.21

Notes:

Coordinates shown are based on Iowa South Coordinate System (NAD83).

Elevations shown are based on NAVD88 vertical datum.

Appendix E

Survey Data—North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Well Designation	Northing	Easting	PVC Elevation	Ground Elevation
NBP-MW1	302233.92	2276005.232	683.745	681.045

Notes:

Coordinates shown are based on Iowa South Coordinate System (NAD83).

Elevations shown are based on NAVD88 vertical datum.

Appendix E

Survey Data—North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Well Designation	Northing	Easting	PVC Elevation	Ground Elevation
NBPLF-MW3	302722.547	2276494.596	681.335	679.171
NBPLF-MW4	302655.975	2276523.565	677.52	675.29
NBPLF-MW5	302767.429	2276216.76	694.276	691.411
NBPLF-MW6	302752.342	2276498.189	682.63	680.06
JAW-627	302719.054	2276483.26	682.54	680.06

Notes:

Coordinates shown are based on Iowa South Coordinate System (NAD83).

Elevations shown are based on NAVD88 vertical datum.

Appendix E

Survey Data—Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Well Designation	Northing	Easting	PVC Elevation	Ground Elevation
FTA-TT-MW-01	301056.481	2275826.36	685.38	685.65
FTA-TT-MW-02	301053.96	2275764.32	687.27	684.59
FTA-TT-MW-03	301114.585	2275763.983	686.37	686.52
FTA-TT-MW-04	301088.903	2275795.332	688.48	685.68
FTA-TT-MW-05	301038.701	2275802.601	687.29	684.59
FTP-UNKMW-001	300684.062	2275575.859	678.47	675.62

Notes:

Coordinates shown are based on Iowa South Coordinate System (NAD83).

Elevations shown are based on NAVD88 vertical datum.

Appendix F
Summary of Selected Project Action Limit Objectives

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[(1)]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
1,1,1,2-Tetrachloroethane	630-20-6	µg/L	--	0.57	70	70	7.98
1,1,1-Trichloroethane	71-55-6	µg/L	200	8000	--	200	1240
1,1,2,2-Tetrachloroethane	79-34-5	µg/L	--	0.076	--	0.076	6.59
1,1,2-Trichloroethane	79-00-5	µg/L	5	0.28	3	5	1.17
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	µg/L	--	10000	--	10000	38
1,1´-Biphenyl	92-52-4	µg/L	--	0.83	--	0.83	8.73
1,1-Dichloroethane	75-34-3	µg/L	--	2.8	--	2.8	12.4
1,1-Dichloroethene	75-35-4	µg/L	7	280	400	7	29.7
1,2,3,4,6,7,8-HpCDD	35822-46-9	µg/L	--	--	--	--	0.00103
1,2,3,4,6,7,8-HpCDF	67562-39-4	µg/L	--	--	--	--	0.0128
1,2,3,4,7,8,9-HpCDF	55673-89-7	µg/L	--	--	--	--	0.0128
1,2,3,4,7,8-HxCDF	70648-26-9	µg/L	--	--	--	--	0.000466
1,2,3,6,7,8-HxCDF	57117-44-9	µg/L	--	--	--	--	0.000466
1,2,3-Trichlorobenzene	87-61-6	µg/L	--	7	--	7	--
1,2,3-Trichloropropane	96-18-4	µg/L	--	0.00075	--	0.00075	4.56
1,2,3-Trimethylbenzene	526-73-8	µg/L	--	55	--	55	94.4
1,2,4,5-Tetrachlorobenzene	95-94-3	µg/L	--	0.17	--	0.17	--
1,2,4-Trichlorobenzene	120-82-1	µg/L	70	1.2	70	70	8.78
1,2,4-Trimethylbenzene	95-63-6	µg/L	--	56	--	56	54.4
1,2-Dibromo-3-chloropropane	96-12-8	µg/L	0.2	0.00033	--	0.2	0.0648
1,2-Dibromoethane	106-93-4	µg/L	0.05	0.0075	--	0.05	0.332
1,2-Dichlorobenzene	95-50-1	µg/L	600	300	600	600	571
1,2-Dichloroethane	107-06-2	µg/L	5	0.17	--	5	3.92
1,2-Dichloropropane	78-87-5	µg/L	5	0.85	--	5	6.38
1,2-Diphenylhydrazine	122-66-7	µg/L	--	0.078	--	0.078	--
1,3,5-Trichlorobenzene	108-70-3	µg/l	--	--	40	40	--
1,3,5-Trimethylbenzene	108-67-8	µg/L	--	60	--	60	38.2
1,3,5-Trinitrobenzene	99-35-4	µg/L	--	590	--	590	--
1,3-Dichlorobenzene	541-73-1	µg/L	--	--	600	600	--
1,3-Dichloropropane	142-28-9	µg/L	--	370	--	370	--
1,3-Dichloropropene	542-75-6	µg/L	--	0.47	--	0.47	8.93
1,3-Dinitrobenzene	99-65-0	µg/L	--	2	1	2	--
1,4-Dichlorobenzene	106-46-7	µg/L	75	0.48	75	75	5.57
1,4-Dioxane	123-91-1	µg/l	--	0.46	200	200	5280
1-Methyl naphthalene	90-12-0	µg/L	--	1.1	--	1.1	--
2-(2-N-BUTOXYETHOXY) ETHANOL	112-34-5	µg/L	--	600	--	600	--
2,2'-Oxybis (1-chloro)propane	108-60-1	µg/L	--	710	300	710	--

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[(1)]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
2,3,4,6-Tetrachlorophenol	58-90-2	µg/L	--	240	--	240	--
2,3,7,8-TCDD	1746-01-6	µg/L	3.0E-05	1.2E-07	--	0.00003	0.0000361
2,3,7,8-TCDF	51207-31-9	µg/L	--	--	--	--	0.00108
2,4,5-T	93-76-5	µg/L	--	160	70	160	--
2,4,5-TP (Silvex)	93-72-1	µg/L	50	110	50	50	--
2,4,5-Trichlorophenol	95-95-4	µg/L	--	1200	--	1200	--
2,4,6-Trichlorophenol	88-06-2	µg/L	--	4.1	--	4.1	--
2,4,6-Trinitrotoluene	118-96-7	µg/L	--	2.5	2	2.5	--
2,4-D	94-75-7	µg/L	70	170	--	70	--
2,4-DB	94-82-6	µg/L	--	--	--	--	--
2,4-Dichlorophenol	120-83-2	µg/L	--	46	20	46	--
2,4-Dimethylphenol	105-67-9	µg/L	--	360	--	360	--
2,4-Dinitrophenol	51-28-5	µg/L	--	39	--	39	--
2,4-Dinitrotoluene	121-14-2	µg/L	--	0.24	--	0.24	--
2,6-Dinitrotoluene	606-20-2	µg/L	--	0.049	--	0.049	--
2-Amino-4,6-dinitrotoluene	35572-78-2	µg/L	--	1.9	--	1.9	--
2-Butoxyethanol	111-76-2	µg/L	--	2000	--	2000	--
2-Chloro naphthalene	91-58-7	µg/L	--	750	--	750	--
2-Chloro-1,3-butadiene	126-99-8	µg/L	--	0.019	--	0.019	0.00726
2-Chlorophenol	95-57-8	µg/L	--	91	40	91	--
2-Chlorotoluene	95-49-8	µg/L	--	240	100	240	--
2-Ethyl-1-hexanol	104-76-7	µg/L	--	0.83	--	0.83	123
2-Hexanone	591-78-6	µg/L	--	38	--	38	1650
2-Methyl naphthalene	91-57-6	µg/L	--	36	--	36	--
2-Methylphenol	95-48-7	µg/L	--	930	--	930	--
2-Naphthylamine	91-59-8	µg/L	--	0.039	--	0.039	--
2-Nitroaniline	88-74-4	µg/L	--	190	--	190	--
2-Nitropropane	79-46-9	µg/L	--	0.0097	--	0.0097	1.98
2-Nitrotoluene	88-72-2	µg/L	--	0.31	--	0.31	--
3&4-Methylphenol	1319-77-3	µg/L	--	1500	--	1500	--
3,3-Dichlorobenzidene	91-94-1	µg/L	--	0.13	--	0.13	--
3-Amino-2,5-Dichlorobenzoic Acid	133-90-4	µg/l	--	290	100	290	--
3-Chloropropene	107-05-1	µg/L	--	0.73	--	0.73	0.373
3-Methylphenol	108-39-4	µg/L	--	930	--	930	--
3-Nitrotoluene	99-08-1	µg/L	--	1.7	--	1.7	--
4,4-DDD	72-54-8	µg/L	--	0.032	--	0.032	--
4,4-DDE	72-55-9	µg/L	--	0.046	--	0.046	65.9

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[1]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
4,4-DDT	50-29-3	µg/L	--	0.23	--	0.23	--
4,6-Dinitro-2-methylphenol	534-52-1	µg/L	--	1.5	--	1.5	--
4-Amino-2,6-dinitrotoluene	19406-51-0	µg/L	--	1.9	--	1.9	--
4-Chloro-3-methylphenol	59-50-7	µg/L	--	1400	--	1400	--
4-Chloroaniline	106-47-8	µg/L	--	0.37	--	0.37	--
4-Methyl-2-Pentanol / Methyl Isobutyl Carbinol	108-11-2	µg/L	--	6300	--	6300	417000
4-Methylphenol	106-44-5	µg/L	--	370	--	370	--
4-Nitroaniline	100-01-6	µg/L	--	3.8	--	3.8	--
4-Nitrophenol	100-02-7	µg/L	--	--	60	60	--
4-Nitrotoluene	99-99-0	µg/L	--	4.3	--	4.3	--
Acenaphthene	83-32-9	µg/L	--	530	--	530	--
Acetone	67-64-1	µg/L	--	18000	--	18000	--
Acetonitrile	75-05-8	µg/L	--	130	--	130	7480
Acetophenone	98-86-2	µg/L	--	1900	--	1900	--
Acrolein	107-02-8	µg/L	--	0.042	--	0.042	0.671
Acrylonitrile	107-13-1	µg/L	--	0.052	--	0.052	13
Alachlor	15972-60-8	µg/L	2	1.1	--	2	--
Aldrin	309-00-2	µg/L	--	0.00092	--	0.00092	7.07
alpha-BHC	319-84-6	µg/L	--	0.0072	--	0.0072	--
alpha-Chlordane	5103-71-9	µg/L	--	3.6	--	3.6	--
Aluminum	7429-90-5	µg/L	--	20000	--	20000	--
Ammonia as nitrogen	7664-41-7	µg/l	--	--	30000	30000	108000
Aniline	62-53-3	µg/L	--	13	--	13	--
Anthracene	120-12-7	µg/L	--	1800	--	1800	--
Antimony	7440-36-0	µg/L	6	7.8	6	6	--
Aramite	140-57-8	µg/L	--	1.3	--	1.3	--
Aroclor 1016	12674-11-2	µg/L	--	0.22	--	0.22	17.2
Aroclor 1221	11104-28-2	µg/L	--	0.0047	--	0.0047	0.527
Aroclor 1232	11141-16-5	µg/L	--	0.0047	--	0.0047	0.163
Aroclor 1242	53469-21-9	µg/L	--	0.0078	--	0.0078	1.25
Aroclor 1248	12672-29-6	µg/L	--	0.0078	--	0.0078	0.273
Aroclor 1254	11097-69-1	µg/L	--	0.0078	--	0.0078	1.56
Aroclor 1260	11096-82-5	µg/L	--	0.0078	--	0.0078	0.358
Arsenic	7440-38-2	µg/L	10	0.052	--	10	--
Athraquinone	84-65-1	µg/L	--	1.4	--	1.4	--
Atrazine	1912-24-9	µg/L	3	0.3	--	3	--
Azobenzene	103-33-3	µg/L	--	0.12	--	0.12	475

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[(1)]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
Barium	7440-39-3	µg/L	2000	3800	--	2000	--
Bentazon	25057-89-0	µg/l	--	570	200	570	--
Benzaldehyde	100-52-7	µg/L	--	19	--	19	--
Benzene	71-43-2	µg/L	5	0.46	3	5	2.7
Benzidene	92-87-5	µg/L	--	0.00011	--	0.00011	--
Benzo (a) anthracene	56-55-3	µg/L	--	0.03	--	0.03	176
Benzo (a) pyrene	50-32-8	µg/L	0.2	0.025	--	0.2	--
Benzo (b) fluoranthene	205-99-2	µg/L	--	0.25	--	0.25	--
Benzo (k) fluoranthene	207-08-9	µg/L	--	2.5	--	2.5	--
Benzoic acid	65-85-0	µg/L	--	75000	--	75000	--
Benzyl alcohol	100-51-6	µg/L	--	2000	--	2000	--
Benzyl chloride	100-44-7	µg/L	--	0.089	--	0.089	6.97
Beryllium	7440-41-7	µg/L	4	25	--	4	--
beta-BHC	319-85-7	µg/L	--	0.025	--	0.025	--
bis (2-chloroethoxy) methane	111-91-1	µg/L	--	59	--	59	--
bis (2-chloroethyl) ether	111-44-4	µg/L	--	0.014	--	0.014	30.5
bis (2-Ethylhexyl) adipate	103-23-1	µg/l	400	65	400	400	--
bis (2-ethylhexyl) phthalate	117-81-7	µg/L	6	5.6	--	6	--
Boron	7440-42-8	µg/l	--	4000	6000	6000	--
Bromacil	314-40-9	µg/l	--	--	70	70	--
Bromobenzene	108-86-1	µg/L	--	62	60	62	145
Bromochloromethane	74-97-5	µg/L	--	83	90	90	116
Bromodichloromethane	75-27-4	µg/L	80	0.13	--	80	1.55
Bromoform	75-25-2	µg/L	80	3.3	--	80	243
Bromomethane	74-83-9	µg/L	--	7.5	10	10	2.48
Butylbenzylphthalate	85-68-7	µg/L	--	16	--	16	--
Cadmium	7440-43-9	µg/L	5	1.8	5	5	--
Calcium	7440-70-2	µg/L	--	--	--	--	--
Caprolactam	105-60-2	µg/L	--	9900	--	9900	--
Carbaryl	63-25-2	µg/L	--	1800	--	1800	--
Carbofuran	1563-66-2	µg/L	40	94	--	40	--
Carbon disulfide	75-15-0	µg/L	--	810	--	810	191
Carbon tetrachloride	56-23-5	µg/L	5	0.46	30	5	0.693
Chlordane	57-74-9	µg/L	2	0.02	--	2	139
Chlorfenvinphos	470-90-6	µg/L	--	11	--	11	--
Chloro methane	74-87-3	µg/L	--	190	--	190	34.9
Chlorobenzene	108-90-7	µg/L	100	78	100	100	78.6

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[(1)]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
Chlorodifluoromethane	75-45-6	µg/L	--	100000	--	100000	4020
Chloroethane	75-00-3	µg/L	--	8300	--	8300	1340
Chloroform	67-66-3	µg/L	80	0.22	70	80	1.33
Chloropyrifos	2921-88-2	µg/l	--	8.4	2	8.4	--
Chromium	7440-47-3	µg/L	100	--	--	100	--
Chromium III	16065-83-1	µg/l	--	22000	--	22000	--
Chromium, Hexavalent	18540-29-9	µg/L	--	0.035	--	0.035	--
Chrysene	218-01-9	µg/L	--	25	--	25	--
cis-1,2-Dichloroethene	156-59-2	µg/L	70	25	10	70	41.6
cis-1,4-Dichloro-2-butene	1476-11-5	µg/L	--	0.0013	--	0.0013	0.0516
Cobalt	7440-48-4	µg/L	--	6	--	6	--
Copper	7440-50-8	µg/L	1300	800	--	1300	--
Cyanide	57-12-5	µg/L	200	1.5	--	200	20.1
Cyclohexane	110-82-7	µg/L	--	13000	--	13000	172
Cyclohexanone	108-94-1	µg/L	--	1400	--	1400	470000
Dacthal	1861-32-1	µg/l	--	120	70	120	--
Dalapon	75-99-0	µg/L	200	600	200	200	--
Diazinon	333-41-5	µg/l	--	10	1	10	--
Dibenzo (a,h) anthracene	53-70-3	µg/L	--	0.025	--	0.025	--
Dibenzofuran	132-64-9	µg/L	--	7.9	--	7.9	--
Dibenzothiophene	132-65-0	µg/L	--	--	--	--	--
Dibromochloromethane	124-48-1	µg/L	80	0.87	60	80	--
Dibromomethane	74-95-3	µg/L	--	8.3	--	8.3	22
Dicamba	1918-00-9	µg/L	--	570	4000	4000	--
Dichlorodifluoromethane	75-71-8	µg/L	--	200	1000	1000	0.963
Dichlorvos	62-73-7	µg/L	--	0.26	--	0.26	--
Dicyclopentadiene	77-73-6	µg/L	--	0.63	--	0.63	0.0142
Dieldrin	60-57-1	µg/L	--	0.0018	--	0.0018	--
Diethyl phthalate	84-66-2	µg/L	--	15000	--	15000	--
Di-isopropyl ether	108-20-3	µg/L	--	1500	--	1500	1160
Diisopropyl methylphosphonate	1445-75-6	µg/l	--	1600	600	1600	--
Dimethoate	60-51-5	µg/L	--	44	--	44	--
Di-n-butyl phthalate	84-74-2	µg/L	--	900	--	900	--
Di-n-octyl phthalate	117-84-0	µg/L	--	200	--	200	--
Dinoseb	88-85-7	µg/L	7	15	7	7	--
Diphenyl ether	101-84-8	µg/L	--	0.83	--	0.83	10.4
Diphenylamine	122-39-4	µg/L	--	1300	--	1300	--

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[(1)]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
Diquat	85-00-7	µg/L	20	--	--	20	--
Endo sulfan	115-29-7	µg/L	--	100	--	100	--
Endosulfan sulfate	1031-07-8	µg/L	--	110	--	110	--
Endothall	145-73-3	µg/l	100	380	50	100	--
Endrin	72-20-8	µg/L	2	2.3	2	2	--
Ethyl- benzene	100-41-4	µg/L	700	1.5	700	700	6.85
Ethyl ether	60-29-7	µg/L	--	3900	--	3900	--
Ethyl Methacrylate	97-63-2	µg/L	--	630	--	630	3210
Ethyl Parathion	56-38-2	µg/L	--	86	--	86	--
Ethylene glycol	107-21-1	µg/l	--	16000	14000	16000	--
Fluoranthene	206-44-0	µg/L	--	800	--	800	--
Fluorene	86-73-7	µg/L	--	290	--	290	--
Fluoride	16984-48-8	µg/l	4000	800	--	4000	--
Fluorine	7782-41-4	µg/L	4000	1200	--	4000	--
gamma-BHC	58-89-9	µg/L	0.2	0.042	--	0.2	--
gamma-Chlordane	5103-74-2	µg/L	--	10	4	10	--
Guthion	86-50-0	µg/L	--	56	--	56	--
Heptachlor	76-44-8	µg/L	0.4	0.0014	--	0.4	0.572
Heptachlor Epoxide	1024-57-3	µg/L	0.2	0.0014	--	0.2	5.36
Hexachlorobenzene	118-74-1	µg/L	1	0.0098	--	1	0.275
Hexachlorobutadiene	87-68-3	µg/L	--	0.14	--	0.14	0.716
Hexachlorocyclopentadiene	77-47-4	µg/L	50	0.41	--	50	0.958
Hexachloroethane	67-72-1	µg/L	--	0.33	1	1	1.6
Hexane	110-54-3	µg/L	--	1500	--	1500	1.64
HMX	2691-41-0	µg/L	--	1000	400	1000	--
Indeno (1,2,3-cd) pyrene	193-39-5	µg/L	--	0.25	--	0.25	--
Iodine	7553-56-2	µg/L	--	200	--	200	--
Iron	7439-89-6	µg/L	--	14000	--	14000	--
Isobutyl alcohol	78-83-1	µg/L	--	730	--	730	233000
Isophorone	78-59-1	µg/L	--	78	100	100	--
Isopropanol	67-63-0	µg/L	--	410	--	410	132000
Isopropylbenzene	98-82-8	µg/L	--	450	--	450	208
Kepone	143-50-0	µg/L	--	0.0035	--	0.0035	--
Lead	7439-92-1	µg/L	15	15	--	15	--
Lithium	7439-93-2	µg/l	--	40	--	40	--
Magnesium	7439-95-4	µg/L	--	--	--	--	--
Malathion	121-75-5	µg/l	--	390	500	500	--

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[(1)]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
Manganese	7439-96-5	µg/L	--	430	300	430	--
MCPA	94-74-6	µg/L	--	7.5	30	30	--
MCPP	93-65-2	µg/L	--	16	--	16	--
Mercury	7439-97-6	µg/L	2	0.63	2	2	0.252
Methacrylonitrile	126-98-7	µg/L	--	1.9	--	1.9	547
Methanol	67-56-1	µg/L	--	20000	--	20000	20700000
Methoxy chlor	72-43-5	µg/L	40	37	40	40	--
Methyl acetate	79-20-9	µg/L	--	20000	--	20000	--
Methyl ethyl ketone	78-93-3	µg/L	--	5600	4000	5600	389000
Methyl isobutyl ketone	108-10-1	µg/L	--	6300	--	6300	106000
Methyl Mercury	22967-92-6	µg/L	--	2	--	2	--
Methyl Methacrylate	80-62-6	µg/L	--	1400	--	1400	11000
Methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	--	14	--	14	722
Methylene chloride	75-09-2	µg/L	5	11	200	5	742
Metolachlor	51218-45-2	µg/l	--	2700	700	2700	--
Metribuzin	21087-64-9	µg/l	--	490	70	490	--
Mirex	2385-85-5	µg/L	--	0.00088	--	0.00088	0.0166
Molinate	2212-67-1	µg/L	--	30	--	30	--
Molybdenum	7439-98-7	µg/l	--	100	40	100	--
Naphthalene	91-20-3	µg/L	--	0.12	100	100	10.9
N-Butyl Alcohol	71-36-3	µg/L	--	2000	--	2000	--
N-Butylbenzene	104-51-8	µg/L	--	1000	--	1000	--
n-Heptane	142-82-5	µg/L	--	6	--	6	0.921
Nickel	7440-02-0	µg/L	--	390	100	390	--
Nitrate as Nitrate	14797-55-8	µg/l	10000	32000	--	10000	--
Nitrate/Nitrite as Nitrogen	NO3NO2N	µg/L	10000	--	--	10000	--
Nitrite as Nitrogen	14797-65-0	µg/l	1000	2000	--	1000	--
Nitrobenzene	98-95-3	µg/L	--	0.14	--	0.14	177
Nitrocellulose	9004-70-0	µg/L	--	60000000	--	60000000	--
Nitroglycerine	55-63-0	µg/l	--	2	5	5	--
Nitroguanidine	556-88-7	µg/l	--	2000	700	2000	--
N-Nitrosodimethylamine	62-75-9	µg/L	--	0.00011	--	0.00011	1.98
n-Nitroso-di-n-propylamine	621-64-7	µg/L	--	0.011	--	0.011	--
N-nitrosodiphenylamine	86-30-6	µg/L	--	12	--	12	--
N-Nitrosomethylethylamine	10595-95-6	µg/L	--	0.00071	--	0.00071	7.57
Nonane	111-84-2	µg/L	--	5.3	--	5.3	0.0321
N-Propylbenzene	103-65-1	µg/L	--	660	--	660	516

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[(1)]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
Orthophosphate	7723-14-0	µg/l	--	0.4	0.1	0.4	--
Paraquat	1910-42-5	µg/l	--	90	30	90	--
p-Chlorotoluene	106-43-4	µg/L	--	250	100	250	--
Pentachlorobenzene	608-93-5	µg/L	--	3.2	--	3.2	--
Pentachloroethane	76-01-7	µg/L	--	0.65	--	0.65	--
Pentachloronitrobenzene	82-68-8	µg/L	--	0.12	--	0.12	--
Pentachlorophenol	87-86-5	µg/L	1	0.041	40	1	--
Pentane	109-66-0	µg/L	--	2100	--	2100	3.1
Perchlorate	14797-73-0	µg/L	15	14	15	15	--
PETN	78-11-5	µg/L	--	17	--	17	--
Phenacetin	62-44-2	µg/L	--	34	--	34	--
Phenol	108-95-2	µg/L	--	5800	2000	5800	--
Picloram	1918-02-1	µg/L	500	1400	--	500	--
Potassium	7440-09-7	µg/L	--	--	--	--	--
Propachlor	1918-16-7	µg/L	--	250	--	250	--
Pyrene	129-00-0	µg/L	--	120	--	120	--
Pyridine	110-86-1	µg/L	--	20	--	20	--
RDX	121-82-4	µg/L	--	0.97	2	2	--
Safrole	94-59-7	µg/L	--	0.096	--	0.096	--
sec-Butylbenzene	135-98-8	µg/L	--	2000	--	2000	--
Selenium	7782-49-2	µg/L	50	100	50	50	--
Silver	7440-22-4	µg/L	--	94	130	130	--
Simazine	122-34-9	µg/L	4	0.61	--	4	--
Sodium	7440-23-5	µg/L	--	--	--	--	--
Strontium	7440-24-6	µg/l	--	12000	4000	12000	--
Styrene	100-42-5	µg/L	100	1200	100	100	1940
Sulfotep	3689-24-5	µg/L	--	7.1	--	7.1	--
tert-Butylbenzene	98-06-6	µg/L	--	690	--	690	--
Tetrachloroethene	127-18-4	µg/L	5	11	10	5	10.9
Tetrahydrofuran	109-99-9	µg/L	--	3400	--	3400	120000
Tetryl	479-45-8	µg/L	--	39	--	39	--
Thallium	7440-28-0	µg/L	2	0.2	--	2	--
Tin	7440-31-5	µg/l	--	12000	--	12000	--
Toluene	108-88-3	µg/L	1000	1100	--	1000	3520
Total HxCDD	34465-46-8	µg/L	--	0.000013	--	0.000013	--
Total PCBs	1336-36-3	µg/L	0.5	0.044	--	0.5	0.29
Toxaphene	8001-35-2	µg/L	3	0.071	--	3	--

Table F-1. Groundwater Screening Levels

Analyte	CAS	Unit	Federal MCL (March 2018)	USEPA Tapwater RSL (HQ = 1) (May 2023)	USEPA Health Advisory Level (March 2018)	Final Site Characterization PAL[1]	Vapor Intrusion Screening Level (TCR=1E-06 or THQ=0.1)
trans-1,2-Dichloroethene	156-60-5	µg/L	100	68	100	100	17.5
trans-1,4-Dichloro-2-butene	110-57-6	µg/L	--	0.0013	--	0.0013	0.0516
Tributylphosphate	126-73-8	µg/L	--	5.2	--	5.2	--
Trichloroethene	79-01-6	µg/L	5	0.49	--	5	0.897
Trichlorofluoromethane (Freon 11)	75-69-4	µg/L	--	5200	2000	5200	--
Trifluralin	1582-09-8	µg/l	--	2.6	10	10	--
Tungsten	7440-33-7	µg/l	--	16	--	16	--
Uranium	7440-61-1	µg/l	30	4	--	30	--
Vanadium	7440-62-2	µg/L	--	86	--	86	--
Vinyl acetate	108-05-4	µg/L	--	410	--	410	1840
Vinyl chloride	75-01-4	µg/L	2	0.019	--	2	0.197
Xylene, m-	108-38-3	µg/L	--	190	--	190	70.3
Xylene, o-	95-47-6	µg/L	--	190	--	190	98.5
Xylene, p-	106-42-3	µg/L	--	190	--	190	73.1
Xylenes, total	1330-20-7	µg/L	10000	190	--	10000	75.9
Zinc	7440-66-6	µg/L	--	6000	2000	6000	--

Notes:

MCL = Maximum Containment Level

PAL = Project Action Level

RSL = Regional Screening Level

TCR = Target Cancer Risk

THQ = Target Hazard Quotient

[1] The Final Site Characterization PAL is the MCL. If no MCL is available, the greater of the HAL and the tap water RSL is selected.

Table F-2. Surface Water Screening Levels

			Ecological						Human Health				
Analyte	CAS	Unit	IAWQC Chronic (June 2019)	USEPA National Recommended Water Quality Criteria – Aquatic Life (September 2020)	USEPA Region 4 Ecological Screening Levels for Surface Water (March 2018)	USEPA Region 5 Ecological Screening Levels for Surface Water (August 2003)	USEPA Region 3 BTAG for Freshwater (July 2006)	Selected Ecological Screening Level	IAWQC, Fish Consumption(1) (February 2022)	USEPA Surface Water RSL - Swim (HQ = 1) (May 2023)	USEPA Surface Water RSL - Wade (HQ = 1) (May 2023)	Selected Human Health Screening Level	Final Site Characterization PAL(2)
1,1,1,2-Tetrachloroethane	630-20-6	µg/L	--	--	85	--	--	85	--	112	307	112	85
1,1,1-Trichloroethane	71-55-6	µg/L	--	--	76	76	11	76	173000	1300000	3650000	173000	76
1,1,2,2-Tetrachloroethane	79-34-5	µg/L	--	--	200	380	610	200	--	28.3	82.4	28.3	28.3
1,1,2-Trichloroethane	79-00-5	µg/L	--	--	730	--	1200	730	--	139	425	139	139
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	µg/L	--	--	--	--	--	--	--	11400000	30900000	11400000	11400000
1,1´-Biphenyl	92-52-4	µg/L	--	--	6.5	--	--	6.5	--	72.8	191	72.8	6.5
1,1-Dichloroethane	75-34-3	µg/L	--	--	410	47	47	410	--	1260	3810	1260	410
1,1-Dichloroethene	75-35-4	µg/L	--	--	130	65	25	130	7100	38800	111000	7100	130
1,2,3,4,6,7,8-HpCDD	35822-46-9	µg/L	--	--	--	--	--	--	--	0.0164	0.072	0.0164	0.0164
1,2,3,4,6,7,8-HpCDF	67562-39-4	µg/L	--	--	--	--	--	--	--	0.0164	0.072	0.0164	0.0164
1,2,3,4,7,8,9-HpCDF	55673-89-7	µg/L	--	--	--	--	--	--	--	0.0164	0.072	0.0164	0.0164
1,2,3,4,7,8-HxCDD	39227-28-6	µg/L	--	--	--	--	--	--	--	0.00164	0.0072	0.00164	0.00164
1,2,3,4,7,8-HxCDF	70648-26-9	µg/L	--	--	--	--	--	--	--	0.00164	0.0072	0.00164	0.00164
1,2,3,6,7,8-HxCDD	57653-85-7	µg/L	--	--	--	--	--	--	--	0.00164	0.0072	0.00164	0.00164
1,2,3,6,7,8-HxCDF	57117-44-9	µg/L	--	--	--	--	--	--	--	0.00164	0.0072	0.00164	0.00164
1,2,3,7,8,9-HxCDD	19408-74-3	µg/L	--	--	--	--	--	--	--	0.00164	0.0072	0.00164	0.00164
1,2,3,7,8,9-HxCDF	72918-21-9	µg/L	--	--	--	--	--	--	--	0.00164	0.0072	0.00164	0.00164
1,2,3,7,8-PeCDD	40321-76-4	µg/L	--	--	--	--	--	--	--	0.000164	0.00072	0.000164	0.000164
1,2,3,7,8-PeCDF	57117-41-6	µg/L	--	--	--	--	--	--	--	0.00548	0.024	0.00548	0.00548
1,2,3,4-Tetrachlorobenzene	634-66-2	µg/L	--	--	3	--	--	3	--	--	--	--	3
1,2,3-Trichlorobenzene	87-61-6	µg/L	--	--	8	--	8	8	--	81.5	214	81.5	8
1,2,3-Trichloropropane	96-18-4	µg/L	--	--	--	--	--	--	--	0.0883	0.257	0.0883	0.0883
1,2,3-Trimethylbenzene	526-73-8	µg/L	--	--	--	--	--	--	--	1220	3210	1220	1220
1,2,4,5-Tetrachlorobenzene	95-94-3	µg/L	--	--	8.3	--	--	8.3	--	1.57	4.09	1.57	1.57
1,2,4-Trichlorobenzene	120-82-1	µg/L	--	--	130	30	24	130	--	23.2	61	23.2	23.2
1,2,4-Trimethylbenzene	95-63-6	µg/L	--	--	15	--	33	15	--	1270	3360	1270	15
1,2-Dibromo-3-chloropropane	96-12-8	µg/L	--	--	--	--	--	--	--	2.34	6.6	2.34	2.34
1,2-Dibromoethane	106-93-4	µg/L	--	--	--	--	--	--	--	4.72	14.9	4.72	4.72
1,2-Dichlorobenzene	95-50-1	µg/L	--	--	23	14	0.7	23	--	18000	47900	18000	23
1,2-Dichloroethane	107-06-2	µg/L	--	--	2000	--	100	2000	370	105	335	105	105
1,2-Dichloroethene (1,2-Dichloroethylene)	540-59-0	µg/L	--	--	970	--	--	970	--	--	--	--	970
1,2-Dichloropropane	78-87-5	µg/L	--	--	520	360	--	520	150	174	517	150	150
1,2-Diphenylhydrazine	122-66-7	µg/L	--	--	1.1	--	--	1.1	--	3.94	10.9	3.94	1.1
1,3,5-Trichlorobenzene	108-70-3	µg/L	--	--	5	--	--	5	--	--	--	--	5
1,3,5-Trimethylbenzene	108-67-8	µg/L	--	--	26	--	71	26	--	1710	4540	1710	26
1,3,5-Trinitrobenzene	99-35-4	µg/L	--	--	11	--	--	11	--	76500	287000	76500	11
1,3-Dichlorobenzene	541-73-1	µg/L	--	--	22	38	150	22	--	--	--	--	22
1,3-Dichloropropane	142-28-9	µg/L	--	--	--	--	--	--	--	20000	59100	20000	20000
1,3-Dichloropropene	542-75-6	µg/L	--	--	1.7	--	--	1.7	--	60.5	177	60.5	1.7
1,3-Dinitrobenzene	99-65-0	µg/L	--	--	22	22	--	22	--	199	681	199	22
1,4-Dichlorobenzene	106-46-7	µg/L	--	--	9.4	9.4	26	9.4	190	231	614	190	9.4
1,4-Dioxane	123-91-1	µg/L	--	--	22000	--	--	22000	--	195	808	195	195
1-Methyl naphthalene	90-12-0	µg/L	--	--	6.1	--	2.1	6.1	--	22.3	58.5	22.3	6.1
2-(2-N-BUTOXYETHOXY) ETHANOL	112-34-5	µg/L	--	--	--	--	--	--	--	86300	343000	86300	86300
2,2'-Oxybis (1-chloro)propane	108-60-1	µg/L	--	--	--	--	--	--	--	32800	94700	32800	32800
2,3,4,6,7,8-HxCDF	60851-34-5	µg/L	--	--	--	--	--	--	--	0.00164	0.0072	0.00164	0.00164
2,3,4,6-Tetrachlorophenol	58-90-2	µg/L	--	--	1	--	--	1	--	2560	6720	2560	1
2,3,4,7,8-PeCDF	57117-31-4	µg/L	--	--	--	--	--	--	--	0.000548	0.0024	0.000548	0.000548
2,3,7,8-TCDD	1746-01-6	µg/L	--	--	3.1E-06	--	--	3.1E-06	5.1E-08	1.6E-04	7.2E-04	5.1E-08	5.1E-08
2,3,7,8-TCDF	51207-31-9	µg/L	--	--	--	--	--	--	--	0.00164	0.0072	0.00164	0.00164

Table F-2. Surface Water Screening Levels

Analyte	CAS	Unit	Ecological						Human Health				Final Site Characterization PAL[2]
			IAWQC Chronic (June 2019)	USEPA National Recommended Water Quality Criteria – Aquatic Life (September 2020)	USEPA Region 4 Ecological Screening Levels for Surface Water (March 2018)	USEPA Region 5 Ecological Screening Levels for Surface Water (August 2003)	USEPA Region 3 BTAG for Freshwater (July 2006)	Selected Ecological Screening Level	IAWQC, Fish Consumption[1] (February 2022)	USEPA Surface Water RSL - Swim (HQ = 1) (May 2023)	USEPA Surface Water RSL - Wade (HQ = 1) (May 2023)	Selected Human Health Screening Level	
2,4,5-T	93-76-5	µg/L	--	--	--	686	686	686	--	4980	13800	4980	686
2,4,5-TP (Silvex)	93-72-1	µg/L	--	--	30	30	30	30	--	2230	5980	2230	30
2,4,5-Trichlorophenol	95-95-4	µg/L	--	--	1.9	--	--	1.9	--	18300	48500	18300	1.9
2,4,6-Trichlorophenol	88-06-2	µg/L	--	--	4.9	--	4.9	4.9	--	110	291	110	4.9
2,4,6-Trinitrotoluene	118-96-7	µg/L	--	--	13	--	100	13	--	455	1600	455	13
2,4-D	94-75-7	µg/L	--	--	79.2	220	--	79.2	--	7130	20300	7130	79.2
2,4-DB	94-82-6	µg/L	--	--	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	120-83-2	µg/L	--	--	11	11	11	11	--	1130	3070	1130	11
2,4-Dimethylphenol	105-67-9	µg/L	--	--	15	100	--	15	--	15100	43300	15100	15
2,4-Dinitrophenol	51-28-5	µg/L	--	--	71	19	--	71	--	3690	12300	3690	71
2,4-Dinitrotoluene	121-14-2	µg/L	--	--	44	44	44	44	--	29.3	92.2	29.3	29.3
2,6-Dinitrotoluene	606-20-2	µg/L	--	--	81	81	81	81	--	5.43	16.7	5.43	5.43
2-Amino-4,6-dinitrotoluene	35572-78-2	µg/L	--	--	18	--	1480	18	--	170	557	170	18
2-Butoxyethanol	111-76-2	µg/L	--	--	--	--	--	--	--	244000	900000	244000	244000
2-Chloro naphthalene	91-58-7	µg/L	--	--	--	0.396	--	0.396	--	9030	23800	9030	0.396
2-Chloro-1,3-butadiene	126-99-8	µg/L	--	--	--	--	--	--	--	9020	24800	9020	9020
2-Chlorophenol	95-57-8	µg/L	--	--	18	24	24	18	--	4660	13600	4660	18
2-Chlorotoluene	95-49-8	µg/L	--	--	--	--	--	--	--	3570	9480	3570	3570
2-Ethyl-1-hexanol	104-76-7	µg/L	--	--	--	--	--	--	--	311	857	311	311
2-Hexanone	591-78-6	µg/L	--	--	99	99	99	99	--	8280	26800	8280	99
2-Methyl naphthalene	91-57-6	µg/L	--	--	4.7	330	4.7	4.7	--	414	1090	414	4.7
2-Methylphenol	95-48-7	µg/L	--	--	67	67	13	67	--	51200	152000	51200	67
2-Naphthylamine	91-59-8	µg/L	--	--	--	--	--	--	--	3.08	8.94	3.08	3.08
2-Nitroaniline	88-74-4	µg/L	--	--	17	--	--	17	--	13300	41100	13300	17
2-Nitrophenol	88-75-5	µg/L	--	--	73	--	1920	73	--	--	--	--	73
2-Nitrotoluene	88-72-2	µg/L	--	--	71	--	--	71	--	23.8	68.7	23.8	23.8
3&4-Methylphenol	1319-77-3	µg/L	--	--	--	--	--	--	--	39500	108000	39500	39500
3,3-Dichlorobenzidene	91-94-1	µg/L	--	--	4.5	4.5	4.5	4.5	0.28	4.81	13	0.28	0.28
3,5-Dinitroanaline (DNA)	618-87-1	µg/L	--	--	70	--	--	70	--	624	1990	624	70
3-Amino-2,5-Dichlorobenzoic Acid	133-90-4	µg/L	--	--	--	--	--	--	--	25000	81300	25000	25000
3-Chloropropene	107-05-1	µg/L	--	--	--	--	--	--	--	254	734	254	254
3-Methylphenol	108-39-4	µg/L	--	--	62	--	--	62	--	50700	150000	50700	62
3-Nitrotoluene	99-08-1	µg/L	--	--	42	--	750	42	--	69.5	197	69.5	42
4,4-DDD	72-54-8	µg/L	--	--	0.01	--	0.011	0.01	--	0.414	1.08	0.414	0.01
4,4-DDE	72-55-9	µg/L	--	--	0.3	4.51E-09	--	0.3	--	62.8	275	62.8	0.3
4,4-DDT	50-29-3	µg/L	0.001	0.001	0.001	0.000011	0.0005	0.001	0.0022	62.8	275	0.0022	0.001
4,6-Dinitro-2-methylphenol	534-52-1	µg/L	--	--	--	23	--	23	--	107	331	107	23
4-Amino-2,6-dinitrotoluene	19406-51-0	µg/L	--	--	11	--	--	11	--	170	557	170	11
4-Bromophenyl phenyl ether	101-55-3	µg/L	--	--	1.5	1.5	1.5	1.5	--	--	--	--	1.5
4-Chloro-3-methylphenol	59-50-7	µg/L	--	--	1	34.8	--	1	--	30900	83400	30900	1
4-Chloroaniline	106-47-8	µg/L	--	--	0.8	232	232	0.8	--	40.7	125	40.7	0.8
4-Isopropyltoluene	99-87-6	µg/L	--	--	16	--	85	16	--	--	--	--	16
4-Methylphenol	106-44-5	µg/L	--	--	53	--	--	53	--	20700	61400	20700	53
4-Nitroaniline	100-01-6	µg/L	--	--	--	--	--	--	--	605	2040	605	605
4-Nitrophenol	100-02-7	µg/L	--	--	58	--	60	58	--	--	--	--	58
4-Nitrotoluene	99-99-0	µg/L	--	--	46	--	1900	46	--	302	864	302	46
Acenaphthene	83-32-9	µg/L	--	--	15	38	5.8	15	--	6070	15900	6070	15
Acenaphthylene	208-96-8	µg/L	--	--	13	4840	--	13	--	--	--	--	13
Acetone	67-64-1	µg/L	--	--	1700	1700	1500	1700	--	2680000	10900000	2680000	1700
Acetonitrile	75-05-8	µg/L	--	--	12000	--	--	12000	--	--	--	--	12000

Table F-2. Surface Water Screening Levels

Analyte	CAS	Unit	Ecological						Human Health				Final Site Characterization PAL[2]
			IAWQC Chronic (June 2019)	USEPA National Recommended Water Quality Criteria – Aquatic Life (September 2020)	USEPA Region 4 Ecological Screening Levels for Surface Water (March 2018)	USEPA Region 5 Ecological Screening Levels for Surface Water (August 2003)	USEPA Region 3 BTAG for Freshwater (July 2006)	Selected Ecological Screening Level	IAWQC, Fish Consumption[1] (February 2022)	USEPA Surface Water RSL - Swim (HQ = 1) (May 2023)	USEPA Surface Water RSL - Wade (HQ = 1) (May 2023)	Selected Human Health Screening Level	
Acetophenone	98-86-2	µg/L	--	--	--	--	--	--	--	155000	495000	155000	155000
Acrolein	107-02-8	µg/L	--	3	3	--	--	3	--	1420	5580	1420	3
Acrylonitrile	107-13-1	µg/L	--	--	78	--	--	78	--	30.5	115	30.5	30.5
Alachlor	15972-60-8	µg/L	--	--	--	--	--	--	--	46.1	126	46.1	46.1
Aldrin	309-00-2	µg/L	--	--	0.04	0.017	3	0.04	0.0005	1.26	5.51	0.0005	0.0005
Alkalinity, total as CaCO3	471-34-1	µg/L	--	20000	20000	--	--	20000	--	--	--	--	20000
alpha-BHC	319-84-6	µg/L	--	--	0.01	12.4	--	0.01	--	0.195	0.519	0.195	0.01
alpha-Chlordane	5103-71-9	µg/L	0.0043	--	--	--	--	0.0043	0.0081	--	--	0.0081	0.0043
Aluminum	7429-90-5	µg/L	87	--	87	--	87	87	--	2790000	10900000	2790000	87
Aniline	62-53-3	µg/L	--	--	4.1	--	--	4.1	--	2440	8640	2440	4.1
Anthracene	120-12-7	µg/L	--	--	0.02	0.035	0.012	0.02	--	16400	43000	16400	0.02
Antimony	7440-36-0	µg/L	--	--	190	80	30	190	640	558	1740	558	190
Aramite	140-57-8	µg/L	--	--	--	--	--	--	--	26.9	70.8	26.9	26.9
Aroclor 1016	12674-11-2	µg/L	--	--	--	--	0.000074	0.000074	--	237	1040	237	0.000074
Aroclor 1221	11104-28-2	µg/L	--	--	--	--	0.000074	0.000074	--	0.137	0.359	0.137	0.000074
Aroclor 1232	11141-16-5	µg/L	--	--	--	--	0.000074	0.000074	--	0.137	0.359	0.137	0.000074
Aroclor 1242	53469-21-9	µg/L	--	--	--	--	0.000074	0.000074	--	10.7	46.8	10.7	0.000074
Aroclor 1248	12672-29-6	µg/L	--	--	--	--	0.000074	0.000074	--	10.7	46.8	10.7	0.000074
Aroclor 1254	11097-69-1	µg/L	--	--	--	--	0.000074	0.000074	--	10.7	46.8	10.7	0.000074
Aroclor 1260	11096-82-5	µg/L	--	--	--	--	0.000074	0.000074	--	10.7	46.8	10.7	0.000074
Arsenic	7440-38-2	µg/L	--	150	150	80	30	150	50	11.7	45.9	11.7	11.7
Athraquinone	84-65-1	µg/L	--	--	--	--	--	--	--	54.2	147	54.2	54.2
Atrazine	1912-24-9	µg/L	--	--	0.03	--	--	0.03	--	24.1	70.1	24.1	0.03
Azobenzene	103-33-3	µg/L	--	--	--	--	--	--	--	8.25	21.8	8.25	8.25
Barium	7440-39-3	µg/L	--	--	220	220	4	220	--	167000	482000	167000	220
Bentazon	25057-89-0	µg/L	--	--	--	--	--	--	--	38900	120000	38900	38900
Benzaldehyde	100-52-7	µg/L	--	--	143	--	--	143	--	2490	7960	2490	143
Benzene	71-43-2	µg/L	--	--	160	114	370	160	510	77.8	220	77.8	77.8
Benzidene	92-87-5	µg/L	--	--	1.5	--	--	1.5	--	0.0285	0.102	0.0285	0.0285
Benzo (a) anthracene	56-55-3	µg/L	--	--	4.7	0.025	0.018	4.7	--	98.6	432	98.6	4.7
Benzo (a) pyrene	50-32-8	µg/L	--	--	0.06	0.014	0.015	0.06	0.18	9.86	43.2	0.18	0.06
Benzo (b) fluoranthene	205-99-2	µg/L	--	--	2.6	9.07	--	2.6	--	98.6	432	98.6	2.6
Benzo(g,h,i)perylene	191-24-2	µg/L	--	--	0.012	--	--	0.012	--	--	--	--	0.012
Benzo (k) fluoranthene	207-08-9	µg/L	--	--	0.06	--	--	0.06	--	986	4320	986	0.06
Benzoic acid	65-85-0	µg/L	--	--	42	--	42	42	--	4820000	14600000	4820000	42
Benzyl alcohol	100-51-6	µg/L	--	--	8.6	8.6	8.6	8.6	--	207000	716000	207000	8.6
Benzyl chloride	100-44-7	µg/L	--	--	--	--	--	--	--	28.9	82.9	28.9	28.9
Beryllium	7440-41-7	µg/L	--	--	11	3.6	0.66	11	--	214	564	214	11
beta-BHC	319-85-7	µg/L	--	--	0.01	0.495	--	0.01	--	0.683	1.82	0.683	0.01
bis (2-chloroethoxy) methane	111-91-1	µg/L	--	--	--	--	--	--	--	6740	24000	6740	6740
bis (2-chloroethyl) ether	111-44-4	µg/L	--	--	--	19000	--	19000	--	11.9	41.2	11.9	11.9
bis (2-Ethylhexyl) adipate	103-23-1	µg/L	--	--	--	--	--	--	--	17800	78000	17800	17800
bis (2-ethylhexyl) phthalate	117-81-7	µg/L	--	--	8	0.3	16	8	22	1530	6680	22	8
Boron	7440-42-8	µg/L	--	--	7200	--	--	7200	--	557000	2180000	557000	7200
Bromobenzene	108-86-1	µg/L	--	--	--	--	--	--	--	3140	8550	3140	3140
Bromochloromethane	74-97-5	µg/L	--	--	--	--	--	--	170	--	--	170	170
Bromodichloromethane	75-27-4	µg/L	--	--	340	--	--	340	--	134	415	134	134
Bromoform	75-25-2	µg/L	--	--	230	230	320	230	1400	1030	3170	1030	230
Bromomethane	74-83-9	µg/L	--	--	16	16	--	16	--	2600	8700	2600	16
Butylbenzylphthalate	85-68-7	µg/L	--	--	23	23	19	23	--	311	817	311	23

Table F-2. Surface Water Screening Levels

Analyte	CAS	Unit	Ecological						Human Health				Final Site Characterization PAL[2]
			IAWQC Chronic (June 2019)	USEPA National Recommended Water Quality Criteria – Aquatic Life (September 2020)	USEPA Region 4 Ecological Screening Levels for Surface Water (March 2018)	USEPA Region 5 Ecological Screening Levels for Surface Water (August 2003)	USEPA Region 3 BTAG for Freshwater (July 2006)	Selected Ecological Screening Level	IAWQC, Fish Consumption[1] (February 2022)	USEPA Surface Water RSL - Swim (HQ = 1) (May 2023)	USEPA Surface Water RSL - Wade (HQ = 1) (May 2023)	Selected Human Health Screening Level	
Cadmium	7440-43-9	µg/L	watershed*	watershed*	watershed*	watershed*	watershed*	watershed*	168	64.1	180	64.1	64.1
Calcium	7440-70-2	µg/L	--	--	116000	--	116000	116000	--	--	--	--	116000
Caprolactam	105-60-2	µg/L	--	--	--	--	--	--	--	1290000	4860000	1290000	1290000
Carbaryl	63-25-2	µg/L	--	2.1	0.2	--	--	2.1	--	108000	322000	108000	2.1
Carbazole	86-74-8	µg/L	--	--	4	--	--	4	--	--	--	--	4
Carbofuran	1563-66-2	µg/L	--	--	0.75	--	--	0.75	--	6110	18600	6110	0.75
Carbon disulfide	75-15-0	µg/L	--	--	15	15	0.92	15	--	83400	241000	83400	15
Carbon tetrachloride	56-23-5	µg/L	--	--	77	240	13.3	77	16	43	118	16	16
Chlordane	57-74-9	µg/L	0.0043	0.0043	0.004	--	--	0.0043	0.0081	--	--	0.0081	0.0043
Chlorfenvinphos	470-90-6	µg/L	--	--	--	--	--	--	--	322	887	322	322
Chloride	16887-00-6	µg/L	389000	230000	230000	--	--	389000	--	--	--	--	389000
Chlorobenzene	108-90-7	µg/L	--	--	25	47	1.3	25	1600	7180	19500	1600	25
Chloroform	67-66-3	µg/L	--	--	140	140	1.8	140	4700	218	652	218	140
Chloropyrifos	2921-88-2	µg/L	0.041	0.041	0.04	--	--	0.041	--	94.7	249	94.7	0.041
Chromium	7440-47-3	µg/L	--	--	--		0.66	0.66	--	--	--	--	0.66
Chromium III	16065-83-1	µg/L	--	watershed*	watershed*	watershed*	watershed*	watershed*	--	291000	773000	291000	291000
Chromium, Hexavalent	18540-29-9	µg/L	11	11	11	--	watershed*	11	3365	1.09	2.9	1.09	1.09
Chrysene	218-01-9	µg/L	--	--	4.7	--	--	4.7	--	9860	43200	9860	4.7
cis-1,2-Dichloroethene	156-59-2	µg/L	--	--	620	--	--	620	--	1630	4690	1630	620
Cobalt	7440-48-4	µg/L	--	--	19	24	23	19	--	934	3880	934	19
Copper	7440-50-8	µg/L	watershed*	--	watershed*	watershed*	watershed*	watershed*	1000	111000	435000	1000	1000
Cyanide	57-12-5	µg/L	5.2	5.2	5.2	--	--	5.2	140	1670	6530	140	5.2
Cyclohexane	110-82-7	µg/L	--	--	158	--	--	158	--	--	--	--	158
Cyclohexanone	108-94-1	µg/L	--	--	--	--	--	--	--	11700000	42300000	11700000	11700000
Dacthal	1861-32-1	µg/L	--	--	--	--	--	--	--	2040	5440	2040	2040
Dalapon	75-99-0	µg/L	--	--	--	--	--	--	--	78600	298000	78600	78600
delta-BHC	319-86-8	µg/L	--	--	--	667	141	667	--	--	--	--	667
Diazinon	333-41-5	µg/L	--	0.17	--	--	--	0.17	--	236	639	236	0.17
Dibenzo (a,h) anthracene	53-70-3	µg/L	--	--	0.012	--	--	0.012	--	9.86	43.2	9.86	0.012
Dibenzofuran	132-64-9	µg/L	--	--	4	4	3.7	4	--	84.4	221	84.4	4
Dibenzothiophene	132-65-0	µg/L	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	124-48-1	µg/L	--	--	320	--	--	320	130	102	316	102	102
Dicamba	1918-00-9	µg/L	--	--	14.7	--	--	14.7	--	40700	126000	40700	14.7
Dichlorodifluoromethane	75-71-8	µg/L	--	--	--	--	--	--	--	176000	512000	176000	176000
Dichlorvos	62-73-7	µg/L	--	--	--	--	--	--	--	50.7	183	50.7	50.7
Dicyclopentadiene	77-73-6	µg/L	--	--	--	--	--	--	--	21200	56800	21200	21200
Dieldrin	60-57-1	µg/L	0.056	0.056	0.06	0.000071	0.056	0.056	0.00054	0.0317	0.0831	0.00054	0.00054
Diethyl phthalate	84-66-2	µg/L	--	--	220	110	210	220	--	889000	2660000	889000	220
Diisopropyl methylphosphonate	1445-75-6	µg/L	--	--	--	--	--	--	--	205000	770000	205000	205000
Dimethoate	60-51-5	µg/L	--	--	0.5	--	--	0.5	--	6420	25700	6420	0.5
Di-n-butyl phthalate	84-74-2	µg/L	--	--	19	9.7	19	19	--	10600	28000	10600	19
Di-n-octyl phthalate	117-84-0	µg/L	--	--	215	30	22	215	--	33800	148000	33800	215
Dinoseb	88-85-7	µg/L	--	--	0.48	0.48	0.05	0.48	--	327	883	327	0.48
Diphenylamine	122-39-4	µg/L	--	--	--	--	--	--	--	21100	56200	21100	21100
Diquat	85-00-7	µg/L	--	--	6	--	--	6	--	2190	6480	2190	6
Endo sulfan	115-29-7	µg/L	--	--	0.06	--	--	0.06	89	3490	9760	89	0.06
Endo sulfan I	959-98-8	µg/L	0.056	0.056	0.06	0.056	0.051	0.056	89	--	--	89	0.056
Endo sulfan II	33213-65-9	µg/L	0.056	0.056	0.06	0.056	0.051	0.056	89	--	--	89	0.056
Endosulfan sulfate	1031-07-8	µg/L	0.056	--	0.06	--	--	0.056	89	4680	13400	89	0.056
Endothall	145-73-3	µg/L	--	--	--	--	--	--	--	31000	98900	31000	31000

Table F-2. Surface Water Screening Levels

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			IAWQC Chronic (June 2019)	USEPA National Recommended Water Quality Criteria – Aquatic Life (September 2020)	USEPA Region 4 Ecological Screening Levels for Surface Water (March 2018)	USEPA Region 5 Ecological Screening Levels for Surface Water (August 2003)	USEPA Region 3 BTAG for Freshwater (July 2006)	Selected Ecological Screening Level	IAWQC, Fish Consumption(1) (February 2022)	USEPA Surface Water RSL - Swim (HQ = 1) (May 2023)	USEPA Surface Water RSL - Wade (HQ = 1) (May 2023)	Selected Human Health Screening Level	Final Site Characterization PAL(2)
Endrin	72-20-8	µg/L	0.036	0.036	0.04	0.036	0.036	0.036	0.06	24.1	63.1	0.06	0.036
Endrin aldehyde	7421-93-4	µg/L	--	--	--	0.15	--	0.15	--	--	--	--	0.15
Ethyl- benzene	100-41-4	µg/L	--	--	61	14	90	61	2100	130	346	130	61
Ethyl ether	60-29-7	µg/L	--	--	--	--	--	--	--	413000	1430000	413000	413000
Ethyl Parathion	56-38-2	µg/L	0.013	0.013	--	--	--	0.013	--	1810	4880	1810	0.013
Ethylene glycol	107-21-1	µg/L	--	--	140000	--	--	140000	--	2640000	11400000	2640000	140000
Fluoranthene	206-44-0	µg/L	--	--	0.8	1.9	0.04	0.8	--	135000	592000	135000	0.8
Fluorene	86-73-7	µg/L	--	--	19	19	3	19	--	3040	7970	3040	19
Fluoride	16984-48-8	µg/L	--	--	2700	--	--	2700	--	111000	435000	111000	2700
Fluorine	7782-41-4	µg/L	--	--	--	--	--	--	--	167000	653000	167000	167000
gamma-BHC	58-89-9	µg/L	--	--	0.11	0.026	0.01	0.11	1.8	1.12	2.97	1.12	0.11
gamma-Chlordane	5103-74-2	µg/L	0.0043	0.0043	--	--	--	0.0043	0.0081	--	--	0.0081	0.0043
Guthion	86-50-0	µg/L	--	0.01	0.01	--	--	0.01	--	3580	10900	3580	0.01
Heptachlor	76-44-8	µg/L	0.0038	0.0038	0.004	0.0038	0.0019	0.0038	0.00079	0.0275	0.0715	0.00079	0.00079
Heptachlor Epoxide	1024-57-3	µg/L	0.0038	0.0038	0.004	0.0038	0.0019	0.0038	0.00039	0.0814	0.214	0.00039	0.00039
Hexachlorobenzene	118-74-1	µg/L	--	--	0.15	0.0003	0.0003	0.15	0.0029	13.4	58.5	0.0029	0.0029
Hexachlorobutadiene	87-68-3	µg/L	--	--	1	0.053	1.3	1	--	5.07	13.3	5.07	1
Hexachlorocyclopentadiene	77-47-4	µg/L	--	--	0.45	--	--	0.45	1100	275	717	275	0.45
Hexachloroethane	67-72-1	µg/L	--	--	12	8	12	12	--	19.9	52.5	19.9	12
Hexane	110-54-3	µg/L	--	--	0.6	--	--	0.6	--	--	--	--	0.6
HMX	2691-41-0	µg/L	--	--	220	--	150	220	--	163000	694000	163000	220
Indeno (1,2,3-cd) pyrene	193-39-5	µg/L	--	--	0.012	4.31	--	0.012	--	98.6	432	98.6	0.012
Iodine	7553-56-2	µg/L	--	--	--	--	--	--	--	27900	109000	27900	27900
Iron	7439-89-6	µg/L	--	1000	1000	--	300	1000	--	1950000	7620000	1950000	1000
Isobutyl alcohol	78-83-1	µg/L	--	--	--	--	--	--	--	667000	2370000	667000	667000
Isophorone	78-59-1	µg/L	--	--	920	920	--	920	--	10100	32100	10100	920
Isopropanol	67-63-0	µg/L	--	--	7.5	--	--	7.5	--	5620000	22000000	5620000	7.5
Isopropylbenzene	98-82-8	µg/L	--	--	4.8	--	2.6	4.8	--	12200	32100	12200	4.8
Lead	7439-92-1	µg/L	watershed*	watershed*	watershed*	watershed*	watershed*	watershed*	--	--	--	--	watershed*
Lithium	7439-93-2	µg/L	--	--	440	--	--	440	--	5570	21800	5570	440
Magnesium	7439-95-4	µg/L	--	--	82000	--	82000	82000	--	--	--	--	82000
Malathion	121-75-5	µg/L	--	0.1	0.1	--	--	0.1	--	35100	116000	35100	0.1
Manganese	7439-96-5	µg/L	--	--	93	--	120	93	--	12800	35500	12800	93
MCPA	94-74-6	µg/L	--	--	2.6	--	--	2.6	--	181	491	181	2.6
MCPP	93-65-2	µg/L	--	--	--	--	--	--	--	418	1140	418	418
Mercury	7439-97-6	µg/L	--	0.77	0.77	0.0013	0.026	0.77	--	--	--	--	0.77
Methacrylonitrile	126-98-7	µg/L	--	--	--	--	--	--	--	226	807	226	226
Methanol	67-56-1	µg/L	--	--	330	--	--	330	--	6270000	26100000	6270000	330
Methoxy chlor	72-43-5	µg/L	--	0.03	0.03	0.019	0.019	0.03	--	384	1010	384	0.03
Methyl acetate	79-20-9	µg/L	--	--	--	--	--	--	--	2780000	10900000	2780000	2780000
Methyl ethyl ketone	78-93-3	µg/L	--	--	22000	2200	14000	22000	--	1610000	6180000	1610000	22000
Methyl isobutyl ketone	108-10-1	µg/L	--	--	170	170	170	170	--	--	--	--	170
Methyl Mercury	2297-92-6	µg/L	--	--	0.0028	--	--	0.0028	--	--	--	--	0.0028
Methyl Methacrylate	80-62-6	µg/L	--	--	--	--	--	--	--	2320000	7520000	2320000	2320000
Methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	--	--	730	--	11070	730	--	7440	25900	7440	730
Methylcyclohexane	108-87-2	µg/L	--	--	52	--	--	52	--	--	--	--	52
Methylene chloride	75-09-2	µg/L	--	--	1500	--	98.1	1500	--	2480	8100	2480	1500
Metolachlor	51218-45-2	µg/L	--	--	7.8	--	--	7.8	--	131000	381000	131000	7.8
Metribuzin	21087-64-9	µg/L	--	--	--	--	--	--	--	49400	168000	49400	49400
Mirex	2385-85-5	µg/L	--	0.001	0.001	--	--	0.001	--	1.19	5.2	1.19	0.001

Table F-2. Surface Water Screening Levels

Analyte	CAS	Unit	Ecological						Human Health				Final Site Characterization PAL[(2)]
			IAWQC Chronic (June 2019)	USEPA National Recommended Water Quality Criteria – Aquatic Life (September 2020)	USEPA Region 4 Ecological Screening Levels for Surface Water (March 2018)	USEPA Region 5 Ecological Screening Levels for Surface Water (August 2003)	USEPA Region 3 BTAG for Freshwater (July 2006)	Selected Ecological Screening Level	IAWQC, Fish Consumption[(1)] (February 2022)	USEPA Surface Water RSL - Swim (HQ = 1) (May 2023)	USEPA Surface Water RSL - Wade (HQ = 1) (May 2023)	Selected Human Health Screening Level	
Molinate	2212-67-1	µg/L	--	--	--	--	--	--	--	707	1920	707	707
Molybdenum	7439-98-7	µg/L	--	--	800	--	73	800	--	13900	54400	13900	800
Naphthalene	91-20-3	µg/L	--	--	21	13	1.1	21	--	11.3	30	11.3	11.3
N-Butyl Alcohol	71-36-3	µg/L	--	--	--	--	--	--	--	208000	720000	208000	208000
N-Butylbenzene	104-51-8	µg/L	--	--	--	--	--	--	--	169000	740000	169000	169000
n-Decane	124-18-5	µg/L	--	--	49	--	--	49	--	--	--	--	49
n-Heptane	142-82-5	µg/L	--	--	--	--	--	--	--	1010	4440	1010	1010
Nickel	7440-02-0	µg/L	watershed*	watershed*	watershed*	watershed*	watershed*	watershed*	4600	32700	106000	4600	4600
Nitrate as Nitrate	14797-55-8	µg/L	--	--	--	--	--	--	--	4460000	17400000	4460000	4460000
Nitrite as Nitrogen	14797-65-0	µg/L	--	--	20	--	--	20	--	279000	1090000	279000	20
Nitrobenzene	98-95-3	µg/L	--	--	230	220	--	230	--	2470	7530	2470	230
Nitrocellulose	9004-70-0	µg/L	--	--	--	--	--	--	--	10100000000	44400000000	10100000000	10100000000
Nitroglycerine	55-63-0	µg/L	--	--	18	--	--	18	--	214	747	214	18
Nitroguanidine	556-88-7	µg/L	--	--	--	--	--	--	--	328000	1410000	328000	328000
N-Nitrosodimethylamine	62-75-9	µg/L	--	--	--	--	117	117	--	0.181	0.759	0.181	0.181
n-Nitroso-di-n-propylamine	621-64-7	µg/L	--	--	--	--	--	--	--	1.72	5.79	1.72	1.72
N-nitrosodiphenylamine	86-30-6	µg/L	--	--	25	--	210	25	--	542	1480	542	25
N-Nitrosomethylethylamine	10595-95-6	µg/L	--	--	--	--	--	--	--	0.844	3.39	0.844	0.844
Nonane	111-84-2	µg/L	--	--	--	--	--	--	--	1010	4440	1010	1010
Nonylphenol	25154-52-3	µg/L	--	6.6	1	--	--	6.6	--	--	--	--	6.6
N-Propylbenzene	103-65-1	µg/L	--	--	--	--	128	128	--	11700	30800	11700	128
OCDD	3268-87-9	µg/L	--	--	--	--	--	--	--	0.548	2.4	0.548	0.548
OCDF	39001-02-0	µg/L	--	--	--	--	--	--	--	0.548	2.4	0.548	0.548
Orthophosphate	7723-14-0	µg/L	--	--	1000	--	--	1000	--	55.7	218	55.7	55.7
Paraquat	1910-42-5	µg/L	--	--	--	--	--	--	--	15200	66600	15200	15200
p-Chlorotoluene	106-43-4	µg/L	--	--	--	--	--	--	--	4060	10800	4060	4060
Pentachloroaniline	527-20-8	µg/L	--	--	5	--	--	5	--	--	--	--	5
Pentachlorobenzene	608-93-5	µg/L	--	--	3.1	--	--	3.1	--	26	67.9	26	3.1
Pentachloroethane	76-01-7	µg/L	--	--	--	--	--	--	--	26.7	72.7	26.7	26.7
Pentachloronitrobenzene	82-68-8	µg/L	--	--	--	--	--	--	--	2.33	6.13	2.33	2.33
Pentachlorophenol	87-86-5	µg/L	--	15	15	40	0.5	15	30	0.613	1.6	0.613	0.613
Perchlorate	14797-73-0	µg/L	--	--	--	--	--	--	--	1950	7620	1950	1950
PETN	78-11-5	µg/L	--	--	--	--	--	--	--	2420	7860	2420	2420
Phenacetin	62-44-2	µg/L	--	--	--	--	--	--	--	5570	18900	5570	5570
Phenanthrene	85-01-8	µg/L	--	--	2.3	--	0.4	2.3	--	--	--	--	2.3
Phenol	108-95-2	µg/L	50	--	160	180	4	50	1700000	452000	1430000	452000	50
Picloram	1918-02-1	µg/L	--	--	--	--	--	--	--	130000	436000	130000	130000
Potassium	7440-09-7	µg/L	--	--	53000	--	53000	53000	--	--	--	--	53000
Propachlor	1918-16-7	µg/L	--	--	--	--	--	--	--	17500	54100	17500	17500
Pyrene	129-00-0	µg/L	--	--	4.6	--	0.025	4.6	--	1000	2610	1000	4.6
Pyridine	110-86-1	µg/L	--	--	--	--	--	--	--	2380	8680	2380	2380
RDX	121-82-4	µg/L	--	--	79	--	360	79	--	224	885	224	79
Safrole	94-59-7	µg/L	--	--	--	--	--	--	--	8.38	23.6	8.38	8.38
sec-Butylbenzene	135-98-8	µg/L	--	--	--	--	--	--	--	338000	1480000	338000	338000
Selenium	7782-49-2	µg/L	5	--	5	5	1	5	4200	13900	54400	4200	5
Silver	7440-22-4	µg/L	--	--	watershed*	0.12	3.2	watershed*	--	4020	11600	4020	4020
Simazine	122-34-9	µg/L	--	--	9	--	--	9	--	68.1	209	68.1	9
Sodium	7440-23-5	µg/L	--	--	680000	--	680000	680000	--	--	--	--	680000
Strontium	7440-24-6	µg/L	--	--	5300	--	--	5300	--	1670000	6530000	1670000	5300
Styrene	100-42-5	µg/L	--	--	32	32	72	32	--	58300	157000	58300	32

Table F-2. Surface Water Screening Levels

			Ecological						Human Health				
Analyte	CAS	Unit	IAWQC Chronic (June 2019)	USEPA National Recommended Water Quality Criteria – Aquatic Life (September 2020)	USEPA Region 4 Ecological Screening Levels for Surface Water (March 2018)	USEPA Region 5 Ecological Screening Levels for Surface Water (August 2003)	USEPA Region 3 BTAG for Freshwater (July 2006)	Selected Ecological Screening Level	IAWQC, Fish Consumption(1) (February 2022)	USEPA Surface Water RSL - Swim (HQ = 1) (May 2023)	USEPA Surface Water RSL - Wade (HQ = 1) (May 2023)	Selected Human Health Screening Level	Final Site Characterization PAL(2)
Sulfite	14265-45-3	µg/L	--	--	200	--	--	200	--	--	--	--	200
Sulfotep	3689-24-5	µg/L	--	--	--	--	--	--	--	146	392	146	146
tert-Butylbenzene	98-06-6	µg/L	--	--	--	--	--	--	--	6910	18100	6910	6910
Tetrachloroethene	127-18-4	µg/L	--	--	53	45	111	53	33	718	1920	33	33
Tetrahydrofuran	109-99-9	µg/L	--	--	11000	--	--	11000	--	2270000	8490000	2270000	11000
Tetryl	479-45-8	µg/L	--	--	--	--	--	--	--	4800	17500	4800	4800
Thallium	7440-28-0	µg/L	--	--	6	10	0.8	6	0.47	27.9	109	0.47	0.47
Tin	7440-31-5	µg/L	--	--	180	--	--	180	--	1670000	6530000	1670000	180
Toluene	108-88-3	µg/L	--	--	62	253	2	62	15000	28400	77100	15000	62
Total HxCDD	34465-46-8	µg/L	--	--	--	--	--	--	--	0.0151	0.00345	0.00345	0.00345
Total PAHs	PAHs	µg/L	3	--	--	--	--	3	0.18	--	--	0.18	0.18
Total PCBs	1336-36-3	µg/L	0.014	0.014	0.014	--	--	0.014	0.00064	53.4	234	0.00064	0.00064
Toxaphene	8001-35-2	µg/L	0.002	0.0002	0.0002	0.00014	0.0002	0.002	0.0028	19.4	85.1	0.0028	0.002
trans-1,2-Dichloroethene	156-60-5	µg/L	--	--	558	970	970	558	140	16300	46900	140	140
Tributylphosphate	126-73-8	µg/L	--	--	--	--	--	--	--	144	384	144	144
Trichloroethene	79-01-6	µg/L	80	--	220	--	21	80	300	94.1	267	94.1	80
Trichlorofluoromethane (Freon 11)	75-69-4	µg/L	--	--	--	--	--	--	--	190000	534000	190000	190000
Trifluralin	1582-09-8	µg/L	--	--	0.48	--	--	0.48	--	39.9	104	39.9	0.48
Triphenyl phosphate	115-86-6	µg/L	--	--	4	--	--	4	--	--	--	--	4
Tungsten	7440-33-7	µg/L	--	--	--	--	--	--	--	2230	8710	2230	2230
Uranium	7440-61-1	µg/L	--	--	2.6	--	2.6	2.6	--	557	2180	557	2.6
Vanadium	7440-62-2	µg/L	--	--	27	12	20	27	--	1850	5020	1850	27
Vinyl acetate	108-05-4	µg/L	--	--	16	--	--	16	--	2350000	8490000	2350000	16
Vinyl chloride	75-01-4	µg/L	--	--	930	--	930	930	24	9.34	27.8	9.34	9.34
Xylene, m-	108-38-3	µg/L	--	--	--	--	--	--	--	42100	112000	42100	42100
Xylene, o-	95-47-6	µg/L	--	--	--	--	--	--	--	47000	126000	47000	47000
Xylene, p-	106-42-3	µg/L	--	--	--	--	--	--	--	45100	120000	45100	45100
Xylenes, total	1330-20-7	µg/L	--	--	27	--	--	27	--	44500	119000	44500	27
Zinc	7440-66-6	µg/L	watershed*	120	watershed*	watershed*	watershed*	watershed*	26000	899000	3650000	26000	26000

Notes:

BTAG = Biological Technical Assistance Group

IAWQC = Iowa Ambient Water Quality Criteria

PAL = Project Action Level

RSL = Regional Screening Level

The selected ecological screening level is the first available screening level according to the following hierarchy: IAWQC Chronic, USEPA National Recommended Water Quality Criteria - Aquatic Life, USEPA Region 4, USEPA Region 5, USEPA Region 3 BTAG.

The selected human health screening level is the lowest screening level of the human health criteria listed in the table.

*Selected ecological screening level differs for each watershed as indicated on site-specific report tables.

(1) Fish consumption is not allowed over most of the IAAAP; therefore, this value does not apply to most IAAAP sites.

(2) The Final Site Characterization PAL is the lower of the selected ecological screening level and selected human health screening level.

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological: USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	Ecological: USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Ecological: Selected Ecological Screening Level	Human Health: USEPA Residential Soil RSL (HQ = 1) (May 2023)	Human Health: Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
1,1,1,2-Tetrachloroethane	630-20-6	µg/g	0.07	0.225	0.07	2	2	0.07
1,1,1-Trichloroethane	71-55-6	µg/g	0.04	29.8	0.04	8100	8100	0.04
1,1,2,2-Tetrachloroethane	79-34-5	µg/g	0.127	0.127	0.127	0.6	0.6	0.127
1,1,2-Trichloroethane	79-00-5	µg/g	0.32	28.6	0.32	1.1	1.1	0.32
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	µg/g	--	--	--	6700	6700	6700
1,1´-Biphenyl	92-52-4	µg/g	0.2	--	0.2	47	47	0.2
1,1-Dichloroethane	75-34-3	µg/g	0.14	20.1	0.14	3.6	3.6	0.14
1,1-Dichloroethene	75-35-4	µg/g	0.04	8.28	0.04	230	230	0.04
1,1-Dichloropropene	563-58-6	µg/g	--	--	--	--	--	--
1,2,3,4-Tetrachlorobenzene	634-66-2	µg/g	10	--	10	--	--	10
1,2,3-Trichlorobenzene	87-61-6	µg/g	20	11.1	20	63	63	20
1,2,3-Trichloropropane	96-18-4	µg/g	--	3.36	3.36	0.0051	0.0051	0.0051
1,2,3-Trimethylbenzene	526-73-8	µg/g	--	--	--	340	340	340
1,2,4,5-Tetrachlorobenzene	95-94-3	µg/g	0.18	--	0.18	2.3	2.3	0.18
1,2,4-Trichlorobenzene	120-82-1	µg/g	0.27	11.1	0.27	24	24	0.27
1,2,4-Trimethylbenzene	95-63-6	µg/g	0.09	--	0.09	300	300	0.09
1,2-Dibromo-3-chloropropane	96-12-8	µg/g	--	0.0352	0.0352	0.0053	0.0053	0.0053
1,2-Dibromoethane	106-93-4	µg/g	--	1.23	1.23	0.036	0.036	0.036
1,2-Dichlorobenzene	95-50-1	µg/g	0.09	2.96	0.09	1800	1800	0.09
1,2-Dichloroethane	107-06-2	µg/g	0.4	21.2	0.4	0.46	0.46	0.4
1,2-Dichloroethene (total)	540-59-0	µg/g	0.04	--	0.04	--	--	0.04
1,2-Dichloropropane	78-87-5	µg/g	0.28	32.7	0.28	2.5	2.5	0.28
1,2-Diphenylhydrazine	122-66-7	µg/g	--	--	--	0.68	0.68	0.68
1,3,5-Trichlorobenzene	108-70-3	µg/g	0.07	--	0.07	--	--	0.07
1,3,5-Trimethylbenzene	108-67-8	µg/g	0.16	--	0.16	270	270	0.16
1,3,5-Trinitrobenzene	99-35-4	µg/g	0.3	0.376	0.3	2200	2200	0.3
1,3-Dichlorobenzene	541-73-1	µg/g	0.08	37.7	0.08	--	--	0.08
1,3-Dichloropropane	142-28-9	µg/g	--	--	--	1600	1600	1600
1,3-Dichloropropene	542-75-6	µg/g	0.001	--	0.001	1.8	1.8	0.001
1,3-Dinitrobenzene	99-65-0	µg/g	0.034	0.655	0.034	6.3	6.3	0.034
1,4-Dichlorobenzene	106-46-7	µg/g	0.88	0.546	0.88	2.6	2.6	0.88
1,4-Dioxane	123-91-1	µg/g	--	--	--	5.3	5.3	5.3
1-Chlorohexane	544-10-5	µg/g	--	--	--	--	--	--
1-Methyl naphthalene	90-12-0	µg/g	29	--	29	18	18	18
1-Methyl phenanthrene	832-69-9	µg/g	29	--	29	--	--	29
1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane/ MNX	5755-27-1	µg/g	--	--	--	--	--	--
2-(2-N-BUTOXYETHOXY) ETHANOL	112-34-5	µg/g	--	--	--	1900	1900	1900
2,2-Dichloropropane	594-20-7	µg/g	--	--	--	--	--	--
2,2'-Oxybis (1-chloro)propane	108-60-1	µg/g	--	--	--	3100	3100	3100
2,3,4,5-Tetrachlorophenol	4901-51-3	µg/g	20	--	20	--	--	20
2,3,4,6-Tetrachlorophenol	58-90-2	µg/g	0.04	--	0.04	1900	1900	0.04

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological			Human Health		
			USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Selected Ecological Screening Level	USEPA Residential Soil RSL (HQ = 1) (May 2023)	Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
2,3,5-Trimethylnaphthalene	2245-38-7	µg/g	29	--	29	--	--	29
2,3,7,8-TCDD	1746-01-6	µg/g	0.00000315	--	0.00000315	0.0000048	0.0000048	0.00000315
2,4,5-T	93-76-5	µg/g	--	0.596	0.596	630	630	0.596
2,4,5-TP (Silvex)	93-72-1	µg/g	0.055	0.109	0.055	510	510	0.055
2,4,5-Trichloroaniline	636-30-6	µg/g	20	--	20	--	--	20
2,4,5-Trichlorophenol	95-95-4	µg/g	4	14.1	4	6300	6300	4
2,4,6-Trichlorophenol	88-06-2	µg/g	9.94	9.94	9.94	49	49	9.94
2,4,6-Trinitrotoluene	118-96-7	µg/g	7.5	--	7.5	21	21	7.5
2,4-D	94-75-7	µg/g	--	0.0272	0.0272	700	700	0.0272
2,4-DB	94-82-6	µg/g	--	--	--	--	--	--
2,4-Dichlorophenol	120-83-2	µg/g	0.05	87.5	0.05	190	190	0.05
2,4-Dimethylphenol	105-67-9	µg/g	0.04	0.01	0.04	1300	1300	0.04
2,4-Dinitrophenol	51-28-5	µg/g	0.061	0.0609	0.061	130	130	0.061
2,4-Dinitrotoluene	121-14-2	µg/g	6	1.28	6	1.7	1.7	1.7
2,6-Dimethyl naphthalene	581-42-0	µg/g	29	--	29	--	--	29
2,6-Dinitrotoluene	606-20-2	µg/g	4	0.0328	4	0.36	0.36	0.36
2-Amino-4,6-dinitrotoluene	35572-78-2	µg/g	14	--	14	7.7	7.7	7.7
2-Butoxyethanol	111-76-2	µg/g	--	--	--	6300	6300	6300
2-Chloro naphthalene	91-58-7	µg/g	--	0.0122	0.0122	4800	4800	0.0122
2-Chloro-1,3-butadiene	126-99-8	µg/g	--	--	--	0.01	0.01	0.01
2-Chlorophenol	95-57-8	µg/g	0.06	0.243	0.06	390	390	0.06
2-Chlorotoluene	95-49-8	µg/g	--	--	--	1600	1600	1600
2-Ethyl-1-hexanol	104-76-7	µg/g	--	--	--	15	15	15
2-Hexanone	591-78-6	µg/g	0.36	12.6	0.36	200	200	0.36
2-Methyl naphthalene	91-57-6	µg/g	29	3.24	29	240	240	29
2-Methylphenol	95-48-7	µg/g	0.1	40.4	0.1	3200	3200	0.1
2-Naphthylamine	91-59-8	µg/g	--	--	--	0.3	0.3	0.3
2-Nitroaniline	88-74-4	µg/g	0.02	74.1	0.02	630	630	0.02
2-Nitrophenol	88-75-5	µg/g	--	1.6	1.6	--	--	1.6
2-Nitropropane	79-46-9	µg/g	--	--	--	0.064	0.064	0.064
2-Nitrotoluene	88-72-2	µg/g	0.19	--	0.19	3.2	3.2	0.19
3&4-Methylphenol	1319-77-3	µg/g	--	--	--	6300	6300	6300
3,3-Dichlorobenzidene	91-94-1	µg/g	0.03	0.646	0.03	1.2	1.2	0.03
3,4-Dichlorophenol	95-77-2	µg/g	20	--	20	--	--	20
3,4-Dinitroaniline	95-76-1	µg/g	20	--	20	--	--	20
3-Amino-2,5-Dichlorobenzoic Acid	133-90-4	µg/g	--	--	--	950	950	950
3-Chloroaniline	108-42-9	µg/g	20	--	20	--	--	20
3-Chlorophenol	108-43-0	µg/g	7	--	7	--	--	7
3-Chloropropene	107-05-1	µg/g	--	--	--	0.72	0.72	0.72
3-Methylphenol	108-39-4	µg/g	0.09	--	0.09	3200	3200	0.09
3-Nitroaniline	99-09-2	µg/g	--	3.16	3.16	--	--	3.16

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological			Human Health		Final Site Characterization PAL[1]
			USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Selected Ecological Screening Level	USEPA Residential Soil RSL (HQ = 1) (May 2023)	Selected Human Health Screening Level	
3-Nitrotoluene	99-08-1	µg/g	0.13	--	0.13	6.3	6.3	0.13
4,4-DDD	72-54-8	µg/g	--	0.758	0.758	2.3	2.3	0.758
4,4-DDE	72-55-9	µg/g	--	0.596	0.596	2	2	0.596
4,4-DDT	50-29-3	µg/g	--	0.0035	0.0035	1.9	1.9	0.0035
4,6-Dinitro-2-methylphenol	534-52-1	µg/g	--	0.144	0.144	5.1	5.1	0.144
4-Amino-2,6-dinitrotoluene	19406-51-0	µg/g	12	--	12	7.7	7.7	7.7
4-Bromophenyl phenyl ether	101-55-3	µg/g	--	--	--	--	--	--
4-Chloro-3-methylphenol	59-50-7	µg/g	--	7.95	7.95	6300	6300	7.95
4-Chloroaniline	106-47-8	µg/g	1	1.1	1	2.7	2.7	1
4-Chlorophenyl phenyl ether	7005-72-3	µg/g	--	--	--	--	--	--
4-Isopropyltoluene	99-87-6	µg/g	0.18	--	0.18	--	--	0.18
4-Methyl-2-Pentanol / Methyl Isobutyl Carbinol	108-11-2	µg/g	--	--	--	54000	54000	54000
4-Methylphenol	106-44-5	µg/g	0.08	--	0.08	1300	1300	0.08
4-Nitroaniline	100-01-6	µg/g	--	21.9	21.9	27	27	21.9
4-Nitrophenol	100-02-7	µg/g	5.12	5.12	5.12	--	--	5.12
4-Nitrotoluene	99-99-0	µg/g	0.14	--	0.14	34	34	0.14
Acenaphthene	83-32-9	µg/g	29	682	29	3600	3600	29
Acenaphthylene	208-96-8	µg/g	29	682	29	--	--	29
Acetone	67-64-1	µg/g	1.2	2.5	1.2	70000	70000	1.2
Acetonitrile	75-05-8	µg/g	--	--	--	810	810	810
Acetophenone	98-86-2	µg/g	--	--	--	7800	7800	7800
Acrolein	107-02-8	µg/g	0.0003	--	0.0003	0.14	0.14	0.0003
Acrylonitrile	107-13-1	µg/g	--	--	--	0.25	0.25	0.25
Alachlor	15972-60-8	µg/g	--	--	--	9.7	9.7	9.7
Aldrin	309-00-2	µg/g	0.03	0.00332	0.03	0.039	0.039	0.03
alpha-BHC	319-84-6	µg/g	0.0003	0.0994	0.0003	0.086	0.086	0.0003
alpha-Chlordane	5103-71-9	µg/g	0.0029	0.224	0.0029	36	36	0.0029
Aluminum	7429-90-5	µg/g	--	--	--	77000	77000	77000
Aniline	62-53-3	µg/g	--	--	--	95	95	95
Anthracene	120-12-7	µg/g	29	1480	29	18000	18000	29
Antimony	7440-36-0	µg/g	0.27	0.142	0.27	31	31	0.27
Aramite	140-57-8	µg/g	--	--	--	22	22	22
Aroclor 1016	12674-11-2	µg/g	--	--	--	4.1	4.1	4.1
Aroclor 1221	11104-28-2	µg/g	--	--	--	0.2	0.2	0.2
Aroclor 1232	11141-16-5	µg/g	--	--	--	0.17	0.17	0.17
Aroclor 1242	53469-21-9	µg/g	--	--	--	0.23	0.23	0.23
Aroclor 1248	12672-29-6	µg/g	--	--	--	0.23	0.23	0.23
Aroclor 1254	11097-69-1	µg/g	--	--	--	0.24	0.24	0.24
Aroclor 1260	11096-82-5	µg/g	--	--	--	0.24	0.24	0.24
Arsenic	7440-38-2	µg/g	18	5.7	18	0.68	0.68	0.68
Athraquinone	84-65-1	µg/g	--	--	--	14	14	14

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological			Human Health		
			USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Selected Ecological Screening Level	USEPA Residential Soil RSL (HQ = 1) (May 2023)	Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
Atrazine	1912-24-9	µg/g	0.00005	--	0.00005	2.4	2.4	0.00005
Azobenzene	103-33-3	µg/g	--	--	--	5.6	5.6	5.6
Barium	7440-39-3	µg/g	330	1.04	330	15000	15000	330
Bentazon	25057-89-0	µg/g	--	--	--	1900	1900	1900
Benzaldehyde	100-52-7	µg/g	--	--	--	170	170	170
Benzene	71-43-2	µg/g	0.12	0.255	0.12	1.2	1.2	0.12
Benzidene	92-87-5	µg/g	--	--	--	0.00053	0.00053	0.00053
Benzo (a) anthracene	56-55-3	µg/g	1.1	5.21	1.1	1.1	1.1	1.1
Benzo (a) pyrene	50-32-8	µg/g	1.1	1.52	1.1	0.11	0.11	0.11
Benzo (b) fluoranthene	205-99-2	µg/g	1.1	59.8	1.1	1.1	1.1	1.1
Benzo (e) pyrene	192-97-2	µg/g	1.1	--	1.1	5.7	5.7	1.1
Benzo (ghi) perylene	191-24-2	µg/g	1.1	119	1.1	--	--	1.1
Benzo (k) fluoranthene	207-08-9	µg/g	1.1	148	1.1	11	11	1.1
Benzoic acid	65-85-0	µg/g	0.01	--	0.01	250000	250000	0.01
Benzyl alcohol	100-51-6	µg/g	0.002	65.8	0.002	6300	6300	0.002
Benzyl chloride	100-44-7	µg/g	--	--	--	1.1	1.1	1.1
Beryllium	7440-41-7	µg/g	2.5	1.06	2.5	160	160	2.5
beta-BHC	319-85-7	µg/g	0.0003	0.00398	0.0003	0.3	0.3	0.0003
bis (2-chloroethoxy) methane	111-91-1	µg/g	--	0.302	0.302	190	190	0.302
bis (2-chloroethyl) ether	111-44-4	µg/g	--	23.7	23.7	0.23	0.23	0.23
bis (2-Chloroisopropyl)ether	39638-32-9	µg/g	--	--	--	--	--	--
bis (2-Ethylhexyl) adipate	103-23-1	µg/g	--	--	--	450	450	450
bis (2-ethylhexyl) phthalate	117-81-7	µg/g	0.02	0.925	0.02	39	39	0.02
Boron	7440-42-8	µg/g	7.5	--	7.5	16000	16000	7.5
Bromide	24959-67-9	µg/g	--	--	--	--	--	--
Bromine	7726-95-6	µg/g	10	--	10	--	--	10
Bromobenzene	108-86-1	µg/g	--	--	--	290	290	290
Bromochloromethane	74-97-5	µg/g	--	--	--	150	150	150
Bromodichloromethane	75-27-4	µg/g	--	0.54	0.54	0.29	0.29	0.29
Bromoform	75-25-2	µg/g	0.07	15.9	0.07	19	19	0.07
Bromomethane	74-83-9	µg/g	0.002	0.235	0.002	6.8	6.8	0.002
Butylbenzylphthalate	85-68-7	µg/g	0.59	0.239	0.59	290	290	0.59
Cadmium	7440-43-9	µg/g	0.36	0.00222	0.36	7.1	7.1	0.36
Calcium	7440-70-2	µg/g	--	--	--	--	--	--
Caprolactam	105-60-2	µg/g	--	--	--	31000	31000	31000
Carbaryl	63-25-2	µg/g	0.0003	--	0.0003	6300	6300	0.0003
Carbazole	86-74-8	µg/g	0.07	--	0.07	--	--	0.07
Carbofuran	1563-66-2	µg/g	0.0008	--	0.0008	320	320	0.0008
Carbon disulfide	75-15-0	µg/g	0.005	0.0941	0.005	770	770	0.005
Carbon tetrachloride	56-23-5	µg/g	0.05	2.98	0.05	0.65	0.65	0.05
Chlordane	57-74-9	µg/g	--	--	--	1.7	1.7	1.7

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological			Human Health		
			USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Selected Ecological Screening Level	USEPA Residential Soil RSL (HQ = 1) (May 2023)	Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
Chlorfenvinphos	470-90-6	µg/g	--	--	--	44	44	44
Chloride	16887-00-6	µg/g	--	--	--	--	--	--
Chloro methane	74-87-3	µg/g	--	10.4	10.4	110	110	10.4
Chlorobenzene	108-90-7	µg/g	2.4	13.1	2.4	280	280	2.4
Chlorodifluoromethane	75-45-6	µg/g	--	--	--	49000	49000	49000
Chloroethane	75-00-3	µg/g	--	--	--	5400	5400	5400
Chloroform	67-66-3	µg/g	0.05	1.19	0.05	0.32	0.32	0.05
Chloropyrifos	2921-88-2	µg/g	0.003	--	0.003	63	63	0.003
Chromium	7440-47-3	µg/g	23	0.4	23	--	--	23
Chromium III	16065-83-1	µg/g	26	--	26	120000	120000	26
Chromium, Hexavalent	18540-29-9	µg/g	0.34	--	0.34	0.3	0.3	0.3
Chrysene	218-01-9	µg/g	1.1	4.73	1.1	110	110	1.1
cis-1,2-Dichloroethene	156-59-2	µg/g	0.04	--	0.04	63	63	0.04
cis-1,3-Dichloropropene	10061-01-5	µg/g	--	0.398	0.398	--	--	0.398
cis-1,4-Dichloro-2-butene	1476-11-5	µg/g	--	--	--	0.0074	0.0074	0.0074
Cobalt	7440-48-4	µg/g	13	0.14	13	23	23	13
Copper	7440-50-8	µg/g	28	5.4	28	3100	3100	28
Cyanide	57-12-5	µg/g	0.1	--	0.1	23	23	0.1
Cyclohexane	110-82-7	µg/g	--	--	--	6500	6500	6500
Cyclohexanone	108-94-1	µg/g	--	--	--	28000	28000	28000
Dacthal	1861-32-1	µg/g	--	--	--	630	630	630
Dalapon	75-99-0	µg/g	--	--	--	1900	1900	1900
DDT/DDE/DDD (total)	DDD_DDE_DDT	µg/g	0.021	--	0.021	--	--	0.021
delta-BHC	319-86-8	µg/g	--	0.005	0.005	--	--	0.005
Diazinon	333-41-5	µg/g	0.0037	--	0.0037	44	44	0.0037
Dibenzo (a,h) anthracene	53-70-3	µg/g	1.1	18.4	1.1	0.11	0.11	0.11
Dibenzofuran	132-64-9	µg/g	0.15	--	0.15	78	78	0.15
Dibenzothiophene	132-65-0	µg/g	--	--	--	--	--	--
Dibromochloromethane	124-48-1	µg/g	--	2.05	2.05	8.3	8.3	2.05
Dibromomethane	74-95-3	µg/g	--	6.5	6.5	24	24	6.5
Dicamba	1918-00-9	µg/g	--	--	--	1900	1900	1900
Dichlorodifluoromethane	75-71-8	µg/g	--	39.5	39.5	87	87	39.5
Dichlorprop	120-36-5	µg/g	--	--	--	--	--	--
Dichlorvos	62-73-7	µg/g	--	--	--	1.9	1.9	1.9
Dicyclopentadiene	77-73-6	µg/g	--	--	--	1.3	1.3	1.3
Dieldrin	60-57-1	µg/g	0.0029	0.00238	0.0029	0.034	0.034	0.0029
Diethyl phthalate	84-66-2	µg/g	0.25	24.8	0.25	51000	51000	0.25
Di-isopropyl ether	108-20-3	µg/g	--	--	--	2200	2200	2200
Diisopropyl methylphosphonate	1445-75-6	µg/g	--	--	--	6300	6300	6300
Dimethoate	60-51-5	µg/g	--	--	--	140	140	140
Dimethyl phthalate	131-11-3	µg/g	0.35	0.734	0.35	--	--	0.35

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological			Human Health		
			USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Selected Ecological Screening Level	USEPA Residential Soil RSL (HQ = 1) (May 2023)	Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
Di-n-butyl phthalate	84-74-2	µg/g	0.011	0.15	0.011	6300	6300	0.011
Di-n-octyl phthalate	117-84-0	µg/g	0.91	0.709	0.91	630	630	0.91
Dinoseb	88-85-7	µg/g	0.015	0.0218	0.015	63	63	0.015
Diphenyl ether	101-84-8	µg/g	--	--	--	34	34	34
Diphenylamine	122-39-4	µg/g	1.01	--	1.01	6300	6300	1.01
Diquat	85-00-7	µg/g	--	--	--	140	140	140
Endo sulfan	115-29-7	µg/g	0.0009	--	0.0009	470	470	0.0009
Endo sulfan I	959-98-8	µg/g	0.0009	0.119	0.0009	--	--	0.0009
Endo sulfan II	33213-65-9	µg/g	--	0.119	0.119	--	--	0.119
Endosulfan sulfate	1031-07-8	µg/g	0.0065	0.0358	0.0065	380	380	0.0065
Endothall	145-73-3	µg/g	--	--	--	1300	1300	1300
Endrin	72-20-8	µg/g	0.0019	0.0101	0.0019	19	19	0.0019
Endrin aldehyde	7421-93-4	µg/g	--	0.0105	0.0105	--	--	0.0105
Ethyl- benzene	100-41-4	µg/g	0.27	5.16	0.27	5.8	5.8	0.27
Ethyl ether	60-29-7	µg/g	--	--	--	16000	16000	16000
Ethyl Methacrylate	97-63-2	µg/g	--	--	--	1800	1800	1800
Ethyl Parathion	56-38-2	µg/g	0.00019	--	0.00019	380	380	0.00019
Ethylene glycol	107-21-1	µg/g	0.31	--	0.31	51000	51000	0.31
Fluoranthene	206-44-0	µg/g	1.1	122	1.1	2400	2400	1.1
Fluorene	86-73-7	µg/g	29	122	29	2400	2400	29
Fluoride	16984-48-8	µg/g	32	--	32	3100	3100	32
Fluorine	7782-41-4	µg/g	200	--	200	4700	4700	200
gamma-BHC	58-89-9	µg/g	0.0031	0.005	0.0031	0.57	0.57	0.0031
gamma-Chlordane	5103-74-2	µg/g	0.02	0.224	0.02	36	36	0.02
Guthion	86-50-0	µg/g	0.00006	--	0.00006	190	190	0.00006
Heptachlor	76-44-8	µg/g	0.0016	0.00598	0.0016	0.13	0.13	0.0016
Heptachlor Epoxide	1024-57-3	µg/g	0.00015	0.152	0.00015	0.07	0.07	0.00015
Hexachlorobenzene	118-74-1	µg/g	0.079	0.199	0.079	0.21	0.21	0.079
Hexachlorobutadiene	87-68-3	µg/g	0.009	0.0398	0.009	1.2	1.2	0.009
Hexachlorocyclopentadiene	77-47-4	µg/g	0.001	--	0.001	1.8	1.8	0.001
Hexachloroethane	67-72-1	µg/g	0.024	0.596	0.024	1.8	1.8	0.024
Hexahydro-1,3,5-trinitroso-1,3,5-triazine/ TNX	13980-04-6	µg/g	--	--	--	--	--	--
Hexahydro-1,3-dinitroso-5-dinitro-1,3,5-triazine	DNX	µg/g	--	--	--	--	--	--
Hexane	110-54-3	µg/g	0.007	--	0.007	610	610	0.007
HMX	2691-41-0	µg/g	16	--	16	3900	3900	16
Indeno (1,2,3-cd) pyrene	193-39-5	µg/g	1.1	109	1.1	1.1	1.1	1.1
Iodine	7553-56-2	µg/g	4	--	4	780	780	4
Iron	7439-89-6	µg/g	--	--	--	55000	55000	55000
Isobutyl alcohol	78-83-1	µg/g	--	--	--	7800	7800	7800
Isophorone	78-59-1	µg/g	--	0.139	0.139	570	570	0.139
Isopropanol	67-63-0	µg/g	--	--	--	5600	5600	5600

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological			Human Health		Final Site Characterization PAL[1]
			USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Selected Ecological Screening Level	USEPA Residential Soil RSL (HQ = 1) (May 2023)	Selected Human Health Screening Level	
Isopropylbenzene	98-82-8	µg/g	0.04	--	0.04	1900	1900	0.04
Kepone	KEPONE	µg/g	0.017	--	0.017	0.054	0.054	0.017
Lead	7439-92-1	µg/g	11	0.0537	11	400	400	11
Lithium	7439-93-2	µg/g	2	--	2	160	160	2
Magnesium	7439-95-4	µg/g	--	--	--	--	--	--
Malathion	121-75-5	µg/g	0.00004	--	0.00004	1300	1300	0.00004
Manganese	7439-96-5	µg/g	220	--	220	1800	1800	220
MCPA	94-74-6	µg/g	--	--	--	32	32	32
MCPP	93-65-2	µg/g	--	--	--	63	63	63
Mercury	7439-97-6	µg/g	0.013	0.1	0.013	11	11	0.013
Methacrylonitrile	126-98-7	µg/g	--	--	--	7.5	7.5	7.5
Methanol	67-56-1	µg/g	--	--	--	120000	120000	120000
Methoxy chlor	72-43-5	µg/g	0.0021	0.0199	0.0021	320	320	0.0021
Methyl acetate	79-20-9	µg/g	--	--	--	78000	78000	78000
Methyl ethyl ketone	78-93-3	µg/g	1	89.6	1	27000	27000	1
Methyl isobutyl ketone	108-10-1	µg/g	--	0.443	0.443	33000	33000	0.443
Methyl Mercury	2297-92-6	µg/g	0.00035	--	0.00035	7.8	7.8	0.00035
Methyl Methacrylate	80-62-6	µg/g	--	--	--	4400	4400	4400
Methyl tert-butyl ether (MTBE)	1634-04-4	µg/g	--	--	--	47	47	47
Methylene chloride	75-09-2	µg/g	0.21	4.05	0.21	57	57	0.21
Metolachlor	51218-45-2	µg/g	--	--	--	9500	9500	9500
Metribuzin	21087-64-9	µg/g	--	--	--	1600	1600	1600
Mirex	2385-85-5	µg/g	0.0036	--	0.0036	0.036	0.036	0.0036
Molinate	2212-67-1	µg/g	--	--	--	130	130	130
Molybdenum	7439-98-7	µg/g	2	--	2	390	390	2
Naphthalene	91-20-3	µg/g	29	0.0994	29	2	2	2
N-Butyl Alcohol	71-36-3	µg/g	--	--	--	7800	7800	7800
N-Butylbenzene	104-51-8	µg/g	--	--	--	3900	3900	3900
n-Heptane	142-82-5	µg/g	--	--	--	22	22	22
Nickel	7440-02-0	µg/g	38	13.6	38	1500	1500	38
Nitrate as Nitrate	14797-55-8	µg/g	--	--	--	130000	130000	130000
Nitrate/Nitrite as Nitrogen	NO3NO2N	µg/g	--	--	--	--	--	--
Nitrite as Nitrogen	14797-65-0	µg/g	--	--	--	7800	7800	7800
Nitrobenzene	98-95-3	µg/g	2.2	1.31	2.2	5.1	5.1	2.2
Nitrocellulose	9004-70-0	µg/g	--	--	--	190000000	190000000	190000000
Nitroglycerine	55-63-0	µg/g	13	--	13	6.3	6.3	6.3
Nitroguanidine	556-88-7	µg/g	--	--	--	6300	6300	6300
N-Nitrosodimethylamine	62-75-9	µg/g	--	0.0000321	0.0000321	0.002	0.002	0.0000321
n-Nitroso-di-n-propylamine	621-64-7	µg/g	--	0.544	0.544	0.078	0.078	0.078
N-nitrosodiphenylamine	86-30-6	µg/g	0.545	0.545	0.545	110	110	0.545
N-Nitrosomethylethylamine	10595-95-6	µg/g	--	--	--	0.02	0.02	0.02

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological: USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	Ecological: USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Ecological: Selected Ecological Screening Level	Human Health: USEPA Residential Soil RSL (HQ = 1) (May 2023)	Human Health: Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
Nonane	111-84-2	µg/g	--	--	--	11	11	11
Nonylphenol	25154-52-3	µg/g	1.27	--	1.27	--	--	1.27
N-Propylbenzene	103-65-1	µg/g	--	--	--	3800	3800	3800
Orthophosphate	7723-14-0	µg/g	--	--	--	1.6	1.6	1.6
Paraquat	1910-42-5	µg/g	--	--	--	280	280	280
p-Chlorotoluene	106-43-4	µg/g	--	--	--	1600	1600	1600
Pentachloroaniline	527-20-8	µg/g	100	--	100	--	--	100
Pentachlorobenzene	608-93-5	µg/g	0.5	--	0.5	63	63	0.5
Pentachloroethane	76-01-7	µg/g	--	--	--	7.7	7.7	7.7
Pentachloronitrobenzene	82-68-8	µg/g	0.09	--	0.09	2.7	2.7	0.09
Pentachlorophenol	87-86-5	µg/g	2.1	0.119	2.1	1	1	1
Pentane	109-66-0	µg/g	--	--	--	810	810	810
Perchlorate	14797-73-0	µg/g	--	--	--	55	55	55
Perylene	198-55-0	µg/g	1.1	--	1.1	5.4	5.4	1.1
PETN	78-11-5	µg/g	2.2	--	2.2	130	130	2.2
Phenacetin	62-44-2	µg/g	--	--	--	250	250	250
Phenanthrene	85-01-8	µg/g	29	45.7	29	--	--	29
Phenol	108-95-2	µg/g	0.79	0.12	0.79	19000	19000	0.79
Picloram	1918-02-1	µg/g	--	--	--	4400	4400	4400
Potassium	7440-09-7	µg/g	--	--	--	--	--	--
Propachlor	1918-16-7	µg/g	--	--	--	820	820	820
Pyrene	129-00-0	µg/g	1.1	78.5	1.1	1800	1800	1.1
Pyridine	110-86-1	µg/g	--	--	--	78	78	78
RDX	121-82-4	µg/g	2.3	--	2.3	8.3	8.3	2.3
Safrole	94-59-7	µg/g	--	--	--	0.55	0.55	0.55
sec-Butylbenzene	135-98-8	µg/g	--	--	--	7800	7800	7800
Selenium	7782-49-2	µg/g	0.52	0.0276	0.52	390	390	0.52
Silica	7631-86-9	µg/g	--	--	--	4300000	4300000	4300000
Silver	7440-22-4	µg/g	4.2	4.04	4.2	390	390	4.2
Simazine	122-34-9	µg/g	0.0083	--	0.0083	4.5	4.5	0.0083
Sodium	7440-23-5	µg/g	--	--	--	--	--	--
Strontium	7440-24-6	µg/g	96	--	96	47000	47000	96
Styrene	100-42-5	µg/g	1.2	4.69	1.2	6000	6000	1.2
Sulfate	14808-79-8	µg/g	--	--	--	--	--	--
Sulfotep	3689-24-5	µg/g	--	--	--	32	32	32
tert-Butylbenzene	98-06-6	µg/g	--	--	--	7800	7800	7800
Tetrachloroethene	127-18-4	µg/g	0.06	9.92	0.06	24	24	0.06
Tetrahydrofuran	109-99-9	µg/g	--	--	--	18000	18000	18000
Tetryl	479-45-8	µg/g	0.018	--	0.018	160	160	0.018
Thallium	7440-28-0	µg/g	0.05	0.0569	0.05	0.78	0.78	0.05
Tin	7440-31-5	µg/g	7.6	--	7.6	47000	47000	7.6

Table F-3. Soil Screening Levels

Analyte	CAS	Unit	Ecological: USEPA Region 4 Ecological Screening Levels for Soil (March 2018)	Ecological: USEPA Region 5 Ecological Screening Levels for Soil (August 2003)	Ecological: Selected Ecological Screening Level	Human Health: USEPA Residential Soil RSL (HQ = 1) (May 2023)	Human Health: Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
Toluene	108-88-3	µg/g	0.15	5.45	0.15	4900	4900	0.15
Total HxCDD	34465-46-8	µg/g	--	--	--	0.0001	0.0001	0.0001
Total PAHs	PAHs	µg/g	1.1	--	1.1	--	--	1.1
Total PCBs	1336-36-3	µg/g	0.041	--	0.041	0.23	0.23	0.041
Toxaphene	8001-35-2	µg/g	0.00015	0.119	0.00015	0.49	0.49	0.00015
trans-1,2-Dichloroethene	156-60-5	µg/g	0.04	0.784	0.04	70	70	0.04
trans-1,3-Dichloropropene	10061-02-6	µg/g	--	0.398	0.398	--	--	0.398
trans-1,4-Dichloro-2-butene	110-57-6	µg/g	--	--	--	0.0074	0.0074	0.0074
Tributylphosphate	126-73-8	µg/g	--	--	--	60	60	60
Trichloroethene	79-01-6	µg/g	0.06	12.4	0.06	0.94	0.94	0.06
Trichlorofluoromethane (Freon 11)	75-69-4	µg/g	16.4	16.4	16.4	23000	23000	16.4
Trifluralin	1582-09-8	µg/g	0.079	--	0.079	90	90	0.079
Tungsten	7440-33-7	µg/g	--	--	--	63	63	63
Uranium	7440-61-1	µg/g	25	--	25	16	16	16
Uranium-234	13966-29-5	pCi/g	--	--	--	--	--	--
Uranium-235	15117-96-1	pCi/g	--	--	--	--	--	--
Vanadium	7440-62-2	µg/g	7.8	1.59	7.8	390	390	7.8
Vinyl acetate	108-05-4	µg/g	--	--	--	910	910	910
Vinyl chloride	75-01-4	µg/g	0.03	0.646	0.03	0.059	0.059	0.03
Xylene, m-	108-38-3	µg/g	--	--	--	550	550	550
Xylene, m,p-	XYLMP	µg/g	--	--	--	--	--	--
Xylene, o-	95-47-6	µg/g	--	--	--	640	640	640
Xylene, p-	106-42-3	µg/g	--	--	--	560	560	560
Xylenes, total	1330-20-7	µg/g	0.1	--	0.1	580	580	0.1
Zinc	7440-66-6	µg/g	46	6.62	46	23000	23000	46

Notes:

PAL = Project Action Level

RSL = Regional Screening Level

The selected ecological screening level is the first available screening level according to the following hierarchy: USEPA Region 4 Ecological Screening Level, USEPA Region 5 Ecological Screening Level.

The selected human health screening level is the USEPA Residential Soil RSL.

(1) The Final Site Characterization PAL is the lower of the selected ecological screening level and selected human health screening level.

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological				Human Health		Final Site Characterization PAL[1]
			USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Selected Ecological Screening Level	USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Selected Human Health Screening Level	
1,1,1,2-Tetrachloroethane	630-20-6	µg/g	0.099	--	--	0.099	1510	1510	0.099
1,1,1-Trichloroethane	71-55-6	µg/g	0.07	0.213	0.0302	0.07	22500000	22500000	0.07
1,1,2,2-Tetrachloroethane	79-34-5	µg/g	0.25	0.85	1.36	0.25	197	197	0.25
1,1,2-Trichloroethane	79-00-5	µg/g	0.538	--	1.24	0.538	690	690	0.538
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	µg/g	--	--	--	--	337000000	337000000	337000000
1,1´-Biphenyl	92-52-4	µg/g	0.198	--	--	0.198	4910	4910	0.198
1,1-Dichloroethane	75-34-3	µg/g	0.02	0.000575	--	0.02	6900	6900	0.02
1,1-Dichloroethene	75-35-4	µg/g	0.1	0.0194	0.031	0.1	562000	562000	0.1
1,2,3,4,6,7,8-HpCDD	35822-46-9	µg/g	0.0000025	--	--	0.0000025	0.0268	0.0268	0.0000025
1,2,3,4,6,7,8-HpCDF	67562-39-4	µg/g	0.0000025	--	--	0.0000025	0.0268	0.0268	0.0000025
1,2,3,4,7,8,9-HpCDF	55673-89-7	µg/g	0.0000025	--	--	0.0000025	0.0268	0.0268	0.0000025
1,2,3,4,7,8-HxCDD	39227-28-6	µg/g	0.0000025	--	--	0.0000025	0.00268	0.00268	0.0000025
1,2,3,4,7,8-HxCDF	70648-26-9	µg/g	0.0000025	--	--	0.0000025	0.00268	0.00268	0.0000025
1,2,3,4-Tetrachlorobenzene	634-66-2	µg/g	0.069	--	--	0.069	--	--	0.069
1,2,3,6,7,8-HxCDD	57653-85-7	µg/g	0.0000025	--	--	0.0000025	0.00268	0.00268	0.0000025
1,2,3,6,7,8-HxCDF	57117-44-9	µg/g	0.0000025	--	--	0.0000025	0.00268	0.00268	0.0000025
1,2,3,7,8,9-HxCDD	19408-74-3	µg/g	0.0000025	--	--	0.0000025	0.00268	0.00268	0.0000025
1,2,3,7,8,9-HxCDF	72918-21-9	µg/g	0.0000025	--	--	0.0000025	0.00268	0.00268	0.0000025
1,2,3,7,8-PeCDD	40321-76-4	µg/g	0.0000025	--	--	0.0000025	0.000268	0.000268	0.0000025
1,2,3,7,8-PeCDF	57117-41-6	µg/g	0.0000025	--	--	0.0000025	0.00895	0.00895	0.0000025
1,2,3-Trichlorobenzene	87-61-6	µg/g	0.113	--	0.858	0.113	8980	8980	0.113
1,2,3-Trichloropropane	96-18-4	µg/g	--	--	--	--	0.655	0.655	0.655
1,2,3-Trimethylbenzene	526-73-8	µg/g	--	--	--	--	112000	112000	112000
1,2,4,5-Tetrachlorobenzene	95-94-3	µg/g	0.187	--	--	0.187	337	337	0.187
1,2,4-Trichlorobenzene	120-82-1	µg/g	0.011	5.062	2.1	0.011	1360	1360	0.011
1,2,4-Trimethylbenzene	95-63-6	µg/g	0.097	--	--	0.097	112000	112000	0.097
1,2-Dibromo-3-chloropropane	96-12-8	µg/g	--	--	--	--	24.6	24.6	24.6
1,2-Dibromoethane	106-93-4	µg/g	--	--	--	--	19.7	19.7	19.7
1,2-Dichlorobenzene	95-50-1	µg/g	0.095	0.294	0.0165	0.095	1010000	1010000	0.095
1,2-Dichloroethane	107-06-2	µg/g	0.986	--	--	0.986	432	432	0.986
1,2-Dichloroethene (total)	540-59-0	µg/g	0.2	--	--	0.2	--	--	0.2
1,2-Dichloropropane	78-87-5	µg/g	0.428	0.333	--	0.428	1060	1060	0.428
1,2-Diphenylhydrazine	122-66-7	µg/g	0.0039	--	--	0.0039	34.5	34.5	0.0039
1,3,5-Trichlorobenzene	108-70-3	µg/g	0.068	--	--	0.068	--	--	0.068
1,3,5-Trimethylbenzene	108-67-8	µg/g	0.164	--	--	0.164	112000	112000	0.164

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological: USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	Ecological: USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	Ecological: USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Ecological: Selected Ecological Screening Level	Human Health: USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Human Health: Selected Human Health Screening Level	Final Site Characterization PAL[1]
1,3,5-Trinitrobenzene	99-35-4	µg/g	0.015	--	--	0.015	312000	312000	0.015
1,3-Dichlorobenzene	541-73-1	µg/g	0.089	1.315	4.43	0.089	--	--	0.089
1,3-Dichloropropane	142-28-9	µg/g	--	--	--	--	225000	225000	225000
1,3-Dichloropropene	542-75-6	µg/g	0.0015	--	--	0.0015	393	393	0.0015
1,3-Dinitrobenzene	99-65-0	µg/g	0.04	0.00861	--	0.04	790	790	0.04
1,4-Dichlorobenzene	106-46-7	µg/g	0.03	0.318	0.599	0.03	7280	7280	0.03
1,4-Dioxane	123-91-1	µg/g	--	--	--	--	393	393	393
1-Methyl naphthalene	90-12-0	µg/g	0.141	--	--	0.141	875	875	0.141
2-(2-N-BUTOXYETHOXY) ETHANOL	112-34-5	µg/g	--	--	--	--	237000	237000	237000
2,2'-Oxybis (1-chloro)propane	108-60-1	µg/g	--	--	--	--	449000	449000	449000
2,3,4,6,7,8-HxCDF	60851-34-5	µg/g	0.0000025	--	--	0.0000025	0.00268	0.00268	0.0000025
2,3,4,6-Tetrachlorophenol	58-90-2	µg/g	0.03	--	--	0.03	237000	237000	0.03
2,3,4,7,8-PeCDF	57117-31-4	µg/g	0.0000025	--	--	0.0000025	0.000895	0.000895	0.0000025
2,3,7,8-TCDD	1746-01-6	µg/g	0.0000005	--	--	0.0000005	0.000268	0.000268	0.0000005
2,3,7,8-TCDF	51207-31-9	µg/g	0.0000025	--	--	0.0000025	0.00268	0.00268	0.0000025
2,4,5-T	93-76-5	µg/g	--	58.7	12.3	58.7	79000	79000	58.7
2,4,5-TP (Silvex)	93-72-1	µg/g	0.062	0.675	0.675	0.062	63200	63200	0.062
2,4,5-Trichlorophenol	95-95-4	µg/g	0.034	--	--	0.034	790000	790000	0.034
2,4,6-Trichlorophenol	88-06-2	µg/g	0.089	--	0.213	0.089	2510	2510	0.089
2,4,6-Trinitrotoluene	118-96-7	µg/g	0.027	--	0.092	0.027	1150	1150	0.027
2,4-D	94-75-7	µg/g	0.047	1.273	--	0.047	92700	92700	0.047
2,4-DB	94-82-6	µg/g	--	--	--	--	--	--	--
2,4-Dichlorophenol	120-83-2	µg/g	0.057	0.0817	0.117	0.057	23700	23700	0.057
2,4-Dimethylphenol	105-67-9	µg/g	0.039	0.304	0.029	0.039	158000	158000	0.039
2,4-Dinitrophenol	51-28-5	µg/g	0.223	0.00621	--	0.223	15800	15800	0.223
2,4-Dinitrotoluene	121-14-2	µg/g	0.29	0.0144	0.0416	0.29	88.6	88.6	0.29
2,6-Dinitrotoluene	606-20-2	µg/g	0.296	0.0398	--	0.296	18.5	18.5	0.296
2-Amino-4,6-dinitrotoluene	35572-78-2	µg/g	0.047	--	--	0.047	1100	1100	0.047
2-Butoxyethanol	111-76-2	µg/g	--	--	--	--	790000	790000	790000
2-Chloro naphthalene	91-58-7	µg/g	--	0.417	--	0.417	580000	580000	0.417
2-Chloro-1,3-butadiene	126-99-8	µg/g	--	--	--	--	225000	225000	225000
2-Chlorophenol	95-57-8	µg/g	0.055	0.0319	0.0312	0.055	56200	56200	0.055
2-Chlorotoluene	95-49-8	µg/g	--	--	--	--	225000	225000	225000
2-Ethyl-1-hexanol	104-76-7	µg/g	--	--	--	--	4140	4140	4140
2-Hexanone	591-78-6	µg/g	0.045	0.0582	--	0.045	56200	56200	0.045

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological				Human Health		Final Site Characterization PAL[1]
			USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Selected Ecological Screening Level	USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Selected Human Health Screening Level	
2-Methyl naphthalene	91-57-6	µg/g	0.0202	20.2	20.2	0.0202	29000	29000	0.0202
2-Methylphenol	95-48-7	µg/g	0.119	0.0554	--	0.119	395000	395000	0.119
2-Naphthylamine	91-59-8	µg/g	--	--	--	--	15.4	15.4	15.4
2-Nitroaniline	88-74-4	µg/g	--	--	--	--	79000	79000	79000
2-Nitrophenol	88-75-5	µg/g	0.168	--	--	0.168	--	--	0.168
2-Nitrotoluene	88-72-2	µg/g	0.207	--	--	0.207	179	179	0.207
3&4-Methylphenol	1319-77-3	µg/g	--	--	--	--	790000	790000	790000
3,3-Dichlorobenzidene	91-94-1	µg/g	0.031	0.127	0.127	0.031	61.4	61.4	0.031
3,5-Dinitroaniline	618-87-1	µg/g	0.126	--	--	0.126	3160	3160	0.126
3-Amino-2,5-Dichlorobenzoic Acid	133-90-4	µg/g	--	--	--	--	118000	118000	118000
3-Chloropropene	107-05-1	µg/g	--	--	--	--	1870	1870	1870
3-Methylphenol	108-39-4	µg/g	0.112	--	--	0.112	395000	395000	0.112
3-Nitrotoluene	99-08-1	µg/g	0.145	--	--	0.145	790	790	0.145
4,4-DDD	72-54-8	µg/g	0.0049	0.00488	0.00488	0.0049	115	115	0.0049
4,4-DDE	72-55-9	µg/g	0.0032	0.00316	0.00316	0.0032	116	116	0.0032
4,4-DDT	50-29-3	µg/g	0.0042	0.00416	--	0.0042	103	103	0.0042
4,6-Dinitro-2-methylphenol	534-52-1	µg/g	1.477	0.104	--	1.477	632	632	1.477
4-Amino-2,6-dinitrotoluene	19406-51-0	µg/g	0.028	--	--	0.028	1080	1080	0.028
4-Bromophenyl phenyl ether	101-55-3	µg/g	0.047	1.55	1.23	0.047	--	--	0.047
4-Chloro-3-methylphenol	59-50-7	µg/g	0.005	0.388	--	0.005	790000	790000	0.005
4-Chloroaniline	106-47-8	µg/g	0.0009	0.146	--	0.0009	138	138	0.0009
4-Isopropyltoluene	99-87-6	µg/g	0.184	--	--	0.184	--	--	0.184
4-Methylphenol	106-44-5	µg/g	0.093	--	--	0.093	158000	158000	0.093
4-Nitroaniline	100-01-6	µg/g	--	--	--	--	1380	1380	1380
4-Nitrophenol	100-02-7	µg/g	0.153	--	--	0.153	--	--	0.153
4-Nitrotoluene	99-99-0	µg/g	0.145	--	4.06	0.145	1730	1730	0.145
Acenaphthene	83-32-9	µg/g	0.0067	--	6.7	0.0067	435000	435000	0.0067
Acenaphthylene	208-96-8	µg/g	0.0059	--	5.9	0.0059	--	--	0.0059
Acetone	67-64-1	µg/g	0.065	--	--	0.065	10100000	10100000	0.065
Acetonitrile	75-05-8	µg/g	4.167	--	--	4.167	--	--	4.167
Acetophenone	98-86-2	µg/g	--	--	--	--	1120000	1120000	1120000
Acrolein	107-02-8	µg/g	0.00093	--	--	0.00093	5620	5620	0.00093
Acrylonitrile	107-13-1	µg/g	0.03	--	--	0.03	72.8	72.8	0.03
Alachlor	15972-60-8	µg/g	--	--	--	--	494	494	494
Aldrin	309-00-2	µg/g	0.029	--	0.002	0.029	2.31	2.31	0.029

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological				Human Health		Final Site Characterization PAL[1]
			USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Selected Ecological Screening Level	USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Selected Human Health Screening Level	
alpha-BHC	319-84-6	µg/g	0.0003	0.006	0.006	0.0003	4.39	4.39	0.0003
Aluminum	7429-90-5	µg/g	25000	--	--	25000	11200000	11200000	25000
Ammonia as nitrogen	7664-41-7	µg/g	230	--	--	230	--	--	230
Aniline	62-53-3	µg/g	0.0023	--	--	0.0023	4850	4850	0.0023
Anthracene	120-12-7	µg/g	0.057	57.2	57.2	0.057	2180000	2180000	0.057
Antimony	7440-36-0	µg/g	2	--	2	2	4490	4490	2
Aramite	140-57-8	µg/g	--	--	--	--	1110	1110	1110
Aroclor 1016	12674-11-2	µg/g	--	--	--	--	353	353	353
Aroclor 1221	11104-28-2	µg/g	--	--	--	--	12.4	12.4	12.4
Aroclor 1232	11141-16-5	µg/g	--	--	--	--	12.4	12.4	12.4
Aroclor 1242	53469-21-9	µg/g	--	--	--	--	12.4	12.4	12.4
Aroclor 1248	12672-29-6	µg/g	--	--	--	--	12.4	12.4	12.4
Aroclor 1254	11097-69-1	µg/g	--	--	--	--	12.4	12.4	12.4
Aroclor 1260	11096-82-5	µg/g	--	--	--	--	12.4	12.4	12.4
Arsenic	7440-38-2	µg/g	9.8	9.79	2	9.8	36.1	36.1	9.8
Athraquinone	84-65-1	µg/g	--	--	--	--	691	691	691
Atrazine	1912-24-9	µg/g	0.0003	--	--	0.0003	120	120	0.0003
Azobenzene	103-33-3	µg/g	--	--	--	--	357	357	357
Barium	7440-39-3	µg/g	20	--	--	20	2250000	2250000	20
Bentazon	25057-89-0	µg/g	--	--	--	--	237000	237000	237000
Benzaldehyde	100-52-7	µg/g	0.059	--	--	0.059	9830	9830	0.059
Benzene	71-43-2	µg/g	0.01	0.142	--	0.01	715	715	0.01
Benzidene	92-87-5	µg/g	0.0011	--	--	0.0011	0.0601	0.0601	0.0011
Benzo (a) anthracene	56-55-3	µg/g	0.108	108	108	0.108	127	127	0.108
Benzo (a) pyrene	50-32-8	µg/g	0.15	150	150	0.15	12.7	12.7	0.15
Benzo (b) fluoranthene	205-99-2	µg/g	0.19	10400	--	0.19	127	127	0.19
Benzo (ghi) perylene	191-24-2	µg/g	0.17	--	170	0.17	--	--	0.17
Benzo (k) fluoranthene	207-08-9	µg/g	0.24	--	240	0.24	1270	1270	0.24
Benzoic acid	65-85-0	µg/g	0.019	--	0.65	0.019	31600000	31600000	0.019
Benzyl alcohol	100-51-6	µg/g	0.0037	0.00104	--	0.0037	790000	790000	0.0037
Benzyl chloride	100-44-7	µg/g	--	--	--	--	231	231	231
Beryllium	7440-41-7	µg/g	--	--	--	--	22500	22500	22500
beta-BHC	319-85-7	µg/g	0.005	0.005	0.005	0.005	15.4	15.4	0.005
bis (2-chloroethoxy) methane	111-91-1	µg/g	--	--	--	--	23700	23700	23700
bis (2-chloroethyl) ether	111-44-4	µg/g	--	3.52	--	3.52	35.7	35.7	3.52

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological				Human Health		Final Site Characterization PAL[1]
			USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Selected Ecological Screening Level	USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Selected Human Health Screening Level	
bis (2-Ethylhexyl) adipate	103-23-1	µg/g	--	--	--	--	23000	23000	23000
bis (2-ethylhexyl) phthalate	117-81-7	µg/g	0.18	0.182	0.18	0.18	1970	1970	0.18
Boron	7440-42-8	µg/g	--	--	--	--	2250000	2250000	2250000
Bromobenzene	108-86-1	µg/g	--	--	--	--	89800	89800	89800
Bromodichloromethane	75-27-4	µg/g	0.21	--	--	0.21	634	634	0.21
Bromoform	75-25-2	µg/g	0.142	0.492	0.654	0.142	4980	4980	0.142
Bromomethane	74-83-9	µg/g	0.0065	0.00137	--	0.0065	15700	15700	0.0065
Butylbenzylphthalate	85-68-7	µg/g	0.1	1.97	10.9	0.1	14500	14500	0.1
Calcium	7440-70-2	µg/g	--	--	--	--	--	--	--
Cadmium	7440-43-9	µg/g	1	0.99	0.99	1	961	961	1
Caprolactam	105-60-2	µg/g	--	--	--	--	3950000	3950000	3950000
Carbaryl	63-25-2	µg/g	0.0003	--	--	0.0003	790000	790000	0.0003
Carbazole	86-74-8	µg/g	0.069	--	--	0.069	--	--	0.069
Carbofuran	1563-66-2	µg/g	0.0009	--	--	0.0009	39500	39500	0.0009
Carbon disulfide	75-15-0	µg/g	0.0078	0.0239	0.000851	0.0078	1120000	1120000	0.0078
Carbon tetrachloride	56-23-5	µg/g	0.057	1.45	0.0642	0.057	562	562	0.057
Chlordane	57-74-9	µg/g	0.0032	--	--	0.0032	--	--	0.0032
Chlorfenvinphos	470-90-6	µg/g	--	--	--	--	5530	5530	5530
Chlorobenzene	108-90-7	µg/g	0.03	0.291	0.00842	0.03	225000	225000	0.03
Chloroform	67-66-3	µg/g	0.087	0.121	--	0.087	1270	1270	0.087
Chloropyrifos	2921-88-2	µg/g	0.003	--	--	0.003	7900	7900	0.003
Chromium	7440-47-3	µg/g	43.4	43.4	43.4	43.4	--	--	43.4
Chromium III	16065-83-1	µg/g	--	--	--	--	16800000	16800000	16800000
Chromium, Hexavalent	18540-29-9	µg/g	--	--	--	--	39.3	39.3	39.3
Chrysene	218-01-9	µg/g	0.166	--	166	0.166	12700	12700	0.166
cis-1,2-Dichloroethene	156-59-2	µg/g	0.432	--	--	0.432	22500	22500	0.432
cis-1,3-Dichloropropene	10061-01-5	µg/g	0.0015	--	--	0.0015	--	--	0.0015
Cobalt	7440-48-4	µg/g	50	50	50	50	3370	3370	50
Copper	7440-50-8	µg/g	31.6	31.6	31.6	31.6	449000	449000	31.6
Cyanide	57-12-5	µg/g	--	--	--	--	6740	6740	6740
Cyclohexanone	108-94-1	µg/g	--	--	--	--	56200000	56200000	56200000
Dacthal	1861-32-1	µg/g	--	--	--	--	79000	79000	79000
Dalapon	75-99-0	µg/g	--	--	--	--	237000	237000	237000
DDT/DDE/DDD (total)	DDD_DDE_DDT	µg/g	0.0053	--	--	0.0053	--	--	0.0053
delta-BHC	319-86-8	µg/g	--	71.5	6.4	71.5	--	--	71.5

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological				Human Health		Final Site Characterization PAL[(1)]
			USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Selected Ecological Screening Level	USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Selected Human Health Screening Level	
Diazinon	333-41-5	µg/g	0.0004	--	--	0.0004	5530	5530	0.0004
Dibenzo (a,h) anthracene	53-70-3	µg/g	0.033	33	33	0.033	12.7	12.7	0.033
Dibenzofuran	132-64-9	µg/g	0.51	0.449	0.415	0.51	11200	11200	0.51
Dibenzothiophene	132-65-0	µg/g	--	--	--	--	--	--	--
Dibromochloromethane	124-48-1	µg/g	0.198	--	--	0.198	468	468	0.198
Dicamba	1918-00-9	µg/g	0.0084	--	--	0.0084	237000	237000	0.0084
Dichlorodifluoromethane	75-71-8	µg/g	--	--	--	--	2250000	2250000	2250000
Dichlorvos	62-73-7	µg/g	--	--	--	--	95.3	95.3	95.3
Dicyclopentadiene	77-73-6	µg/g	--	--	--	--	898000	898000	898000
Dieldrin	60-57-1	µg/g	0.0019	0.0019	0.0019	0.0019	1.73	1.73	0.0019
Diethyl phthalate	84-66-2	µg/g	0.63	0.295	0.603	0.63	6320000	6320000	0.63
Diisopropyl methylphosphonate	1445-75-6	µg/g	--	--	--	--	898000	898000	898000
Dimethoate	60-51-5	µg/g	0.0002	--	--	0.0002	17400	17400	0.0002
Dimethyl phthalate	131-11-3	µg/g	0.678	--	--	0.678	--	--	0.678
Di-n-butyl phthalate	84-74-2	µg/g	0.011	1.114	6.47	0.011	790000	790000	0.011
Di-n-octyl phthalate	117-84-0	µg/g	0.039	40.6	--	0.039	79000	79000	0.039
Dinoseb	88-85-7	µg/g	0.015	0.0145	0.000611	0.015	7900	7900	0.015
Diphenylamine	122-39-4	µg/g	--	--	--	--	790000	790000	790000
Diquat	85-00-7	µg/g	0.025	--	--	0.025	--	--	0.025
Endo sulfan	115-29-7	µg/g	0.00001	--	--	0.00001	67400	67400	0.00001
Endo sulfan I	959-98-8	µg/g	--	0.00326	0.0029	0.00326	--	--	0.00326
Endo sulfan II	33213-65-9	µg/g	0.0009	0.00194	0.014	0.0009	--	--	0.0009
Endosulfan sulfate	1031-07-8	µg/g	0.0007	--	0.0054	0.0007	47400	47400	0.0007
Endothall	145-73-3	µg/g	--	--	--	--	158000	158000	158000
Endrin	72-20-8	µg/g	0.0022	0.00222	0.00222	0.0022	2370	2370	0.0022
Endrin aldehyde	7421-93-4	µg/g	--	0.48	--	0.48	--	--	0.48
Ethyl- benzene	100-41-4	µg/g	0.29	0.175	1.1	0.29	3570	3570	0.29
Ethyl ether	60-29-7	µg/g	--	--	--	--	2250000	2250000	2250000
Ethyl Parathion	56-38-2	µg/g	0.0002	--	--	0.0002	47400	47400	0.0002
Ethylene glycol	107-21-1	µg/g	42.389	--	--	42.389	6320000	6320000	42.389
Fluoranthene	206-44-0	µg/g	0.423	423	423	0.423	290000	290000	0.423
Fluorene	86-73-7	µg/g	0.077	77.4	77.4	0.077	290000	290000	0.077
Fluoride	16984-48-8	µg/g	--	--	--	--	449000	449000	449000
gamma-BHC	58-89-9	µg/g	0.0024	0.00237	0.00237	0.0024	30.6	30.6	0.0024
Guthion	86-50-0	µg/g	0.00006	--	--	0.00006	23700	23700	0.00006

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological: USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	Ecological: USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	Ecological: USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Ecological: Selected Ecological Screening Level	Human Health: USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Human Health: Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
Heptachlor	76-44-8	µg/g	0.0006	0.0006	0.068	0.0006	8.74	8.74	0.0006
Heptachlor Epoxide	1024-57-3	µg/g	0.0025	0.00247	0.00247	0.0025	4.32	4.32	0.0025
Hexachlorobenzene	118-74-1	µg/g	0.02	0.02	0.02	0.02	24.6	24.6	0.02
Hexachlorobutadiene	87-68-3	µg/g	--	0.0265	--	0.0265	504	504	0.0265
Hexachlorocyclopentadiene	77-47-4	µg/g	0.0065	--	--	0.0065	67400	67400	0.0065
Hexachloroethane	67-72-1	µg/g	0.027	0.584	1.027	0.027	983	983	0.027
Hexane	110-54-3	µg/g	0.00094	--	--	0.00094	--	--	0.00094
HMX	2691-41-0	µg/g	0.108	--	--	0.108	548000	548000	0.108
Indeno (1,2,3-cd) pyrene	193-39-5	µg/g	0.2	200	17	0.2	127	127	0.2
Iron	7439-89-6	µg/g	20000	--	20000	20000	7860000	7860000	20000
Isobutyl alcohol	78-83-1	µg/g	--	--	--	--	3370000	3370000	3370000
Isophorone	78-59-1	µg/g	0.876	0.432	--	0.876	29100	29100	0.876
Isopropanol	67-63-0	µg/g	0.0024	--	--	0.0024	22500000	22500000	0.0024
Isopropylbenzene	98-82-8	µg/g	0.035	--	0.086	0.035	1120000	1120000	0.035
Lead	7439-92-1	µg/g	35.8	35.8	35.8	35.8	--	--	35.8
Lithium	7439-93-2	µg/g	--	--	--	--	22500	22500	22500
Magnesium	7439-95-4	µg/g	--	--	--	--	--	--	--
Malathion	121-75-5	µg/g	0.00067	--	--	0.00067	158000	158000	0.00067
Manganese	7439-96-5	µg/g	460	--	460	460	270000	270000	460
MCPA	94-74-6	µg/g	0.0016	--	--	0.0016	3950	3950	0.0016
MCPP	93-65-2	µg/g	--	--	--	--	7900	7900	7900
Mercury	7439-97-6	µg/g	0.18	0.174	0.18	0.18	--	--	0.18
Methacrylonitrile	126-98-7	µg/g	--	--	--	--	1120	1120	1120
Methanol	67-56-1	µg/g	0.102	--	--	0.102	22500000	22500000	0.102
Methoxy chlor	72-43-5	µg/g	0.03	0.0136	0.0187	0.03	39500	39500	0.03
Methyl acetate	79-20-9	µg/g	--	--	--	--	11200000	11200000	11200000
Methyl ethyl ketone	78-93-3	µg/g	7.604	0.0424	--	7.604	6740000	6740000	7.604
Methyl isobutyl ketone	108-10-1	µg/g	0.073	0.0251	--	0.073	--	--	0.073
Methyl Mercury	2297-92-6	µg/g	0.00045	--	--	0.00045	--	--	0.00045
Methyl Methacrylate	80-62-6	µg/g	--	--	--	--	15700000	15700000	15700000
Methyl tert-butyl ether (MTBE)	1634-04-4	µg/g	0.304	--	--	0.304	21800	21800	0.304
Methylene chloride	75-09-2	µg/g	0.018	--	--	0.018	9830	9830	0.018
Metolachlor	51218-45-2	µg/g	0.022	--	--	0.022	1180000	1180000	0.022
Metribuzin	21087-64-9	µg/g	--	--	--	--	197000	197000	197000
Mirex	2385-85-5	µg/g	0.0036	--	--	0.0036	2.18	2.18	0.0036

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological: USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	Ecological: USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	Ecological: USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Ecological: Selected Ecological Screening Level	Human Health: USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Human Health: Selected Human Health Screening Level	Final Site Characterization PAL(1)
Molinate	2212-67-1	µg/g	--	--	--	--	15800	15800	15800
Molybdenum	7439-98-7	µg/g	--	--	--	--	56200	56200	56200
Naphthalene	91-20-3	µg/g	0.176	0.176	0.176	0.176	211	211	0.176
N-Butyl Alcohol	71-36-3	µg/g	--	--	--	--	1120000	1120000	1120000
N-Butylbenzene	104-51-8	µg/g	--	--	--	--	562000	562000	562000
n-Decane	124-18-5	µg/g	0.726	--	--	0.726	--	--	0.726
n-Heptane	142-82-5	µg/g	--	--	--	--	3370	3370	3370
Nickel	7440-02-0	µg/g	22.7	22.7	22.7	22.7	225000	225000	22.7
Nitrate as Nitrate	14797-55-8	µg/g	--	--	--	--	18000000	18000000	18000000
Nitrite as Nitrogen	14797-65-0	µg/g	--	--	--	--	1120000	1120000	1120000
Nitrobenzene	98-95-3	µg/g	0.407	0.145	--	0.407	22500	22500	0.407
Nitrocellulose	9004-70-0	µg/g	--	--	--	--	23700000000	23700000000	23700000000
Nitroglycerine	55-63-0	µg/g	0.01	--	--	0.01	790	790	0.01
Nitroguanidine	556-88-7	µg/g	--	--	--	--	790000	790000	790000
N-Nitrosodimethylamine	62-75-9	µg/g	--	--	--	--	0.385	0.385	0.385
n-Nitroso-di-n-propylamine	621-64-7	µg/g	--	--	--	--	3.95	3.95	3.95
N-nitrosodiphenylamine	86-30-6	µg/g	0.11	--	2.68	0.11	5640	5640	0.11
N-Nitrosomethylethylamine	10595-95-6	µg/g	--	--	--	--	1.79	1.79	1.79
Nonane	111-84-2	µg/g	--	--	--	--	3370	3370	3370
N-Propylbenzene	103-65-1	µg/g	--	--	--	--	1120000	1120000	1120000
OCDD	3268-87-9	µg/g	0.0000025	--	--	0.0000025	0.895	0.895	0.0000025
OCDF	39001-02-0	µg/g	0.0000025	--	--	0.0000025	0.895	0.895	0.0000025
Orthophosphate	7723-14-0	µg/g	--	--	--	--	225	225	225
Paraquat	1910-42-5	µg/g	--	--	--	--	35500	35500	35500
p-Chlorotoluene	106-43-4	µg/g	--	--	--	--	225000	225000	225000
Pentachlorobenzene	608-93-5	µg/g	0.116	--	--	0.116	8980	8980	0.116
Pentachloroethane	76-01-7	µg/g	--	--	--	--	437	437	437
Pentachlorophenol	87-86-5	µg/g	0.01	23	0.504	0.01	47.8	47.8	0.01
Perchlorate	14797-73-0	µg/g	--	--	--	--	7860	7860	7860
PETN	78-11-5	µg/g	--	--	--	--	6430	6430	6430
Phenacetin	62-44-2	µg/g	--	--	--	--	12600	12600	12600
Phenanthrene	85-01-8	µg/g	0.204	--	204	0.204	--	--	0.204
Phenol	108-95-2	µg/g	0.175	0.0491	0.42	0.175	2370000	2370000	0.175
Picloram	01918-02-1	µg/g	--	--	--	--	--	--	--
Potassium	7440-09-7	µg/g	--	--	--	--	--	--	--

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological: USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	Ecological: USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	Ecological: USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Ecological: Selected Ecological Screening Level	Human Health: USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Human Health: Selected Human Health Screening Level	Final Site Characterization PAL[(1)]
Propachlor	1918-16-7	µg/g	--	--	--	--	103000	103000	103000
Pyrene	129-00-0	µg/g	0.195	--	195	0.195	218000	218000	0.195
Pyridine	110-86-1	µg/g	--	--	--	--	11200	11200	11200
RDX	121-82-4	µg/g	0.065	--	0.013	0.065	462	462	0.065
Safrole	94-59-7	µg/g	--	--	--	--	62.8	62.8	62.8
sec-Butylbenzene	135-98-8	µg/g	--	--	--	--	1120000	1120000	1120000
Selenium	7782-49-2	µg/g	0.72	--	2	0.72	56200	56200	0.72
Silver	7440-22-4	µg/g	1	0.5	1	1	56200	56200	1
Simazine	122-34-9	µg/g	0.0003	--	--	0.0003	230	230	0.0003
Sodium	7440-23-5	µg/g	--	--	--	--	--	--	--
Strontium	7440-24-6	µg/g	--	--	--	--	6740000	6740000	6740000
Styrene	100-42-5	µg/g	0.126	0.254	0.559	0.126	2250000	2250000	0.126
Sulfide	18496-25-8	µg/g	39	--	--	39	--	--	39
Sulfotep	3689-24-5	µg/g	--	--	--	--	3950	3950	3950
tert-Butylbenzene	98-06-6	µg/g	--	--	--	--	1120000	1120000	1120000
Tetrachloroethene	127-18-4	µg/g	0.002	0.99	0.468	0.002	18700	18700	0.002
Tetrahydrofuran	109-99-9	µg/g	4.488	--	--	4.488	10100000	10100000	4.488
Tetryl	479-45-8	µg/g	--	--	--	--	22400	22400	22400
Thallium	7440-28-0	µg/g	--	--	--	--	112	112	112
Tin	7440-31-5	µg/g	--	--	--	--	6740000	6740000	6740000
Toluene	108-88-3	µg/g	0.01	1.22	--	0.01	898000	898000	0.01
Total PAHs	PAHs	µg/g	1.61	--	--	1.61	--	--	1.61
Total PCBs	1336-36-3	µg/g	0.0598	--	--	0.0598	12.4	12.4	0.0598
Toxaphene	8001-35-2	µg/g	0.0001	0.000077	0.001	0.0001	25.1	25.1	0.0001
TPH as diesel	PHCD	µg/g	340	--	--	340	--	--	340
TPH as motor oil	MOIL	µg/g	3600	--	--	3600	--	--	3600
trans-1,2-Dichloroethene	156-60-5	µg/g	0.389	0.654	1.05	0.389	225000	225000	0.389
trans-1,3-Dichloropropene	10061-02-6	µg/g	0.0015	--	--	0.0015	--	--	0.0015
Tributylphosphate	126-73-8	µg/g	--	--	--	--	3070	3070	3070
Trichloroethene	79-01-6	µg/g	0.078	--	0.0969	0.078	707	707	0.078
Trichlorofluoromethane (Freon 11)	75-69-4	µg/g	--	--	--	--	3370000	3370000	3370000
Trifluralin	1582-09-8	µg/g	0.079	--	--	0.079	5100	5100	0.079
Triphenyl phosphate	115-86-6	µg/g	0.07	--	--	0.07	--	--	0.07
Tungsten	7440-33-7	µg/g	--	--	--	--	8980	8980	8980
Uranium	7440-61-1	µg/g	100	--	--	100	2250	2250	100

Table F-4. Sediment Screening Levels

Analyte	CAS	Unit	Ecological: USEPA Region 4 Ecological Screening Levels for Sediment (March 2018)	Ecological: USEPA Region 5 Ecological Screening Levels for Sediment (August 2003)	Ecological: USEPA Region 3 BTAG for Freshwater Sediment (July 2006)	Ecological: Selected Ecological Screening Level	Human Health: USEPA Sediment Recreation RSL (HQ=1) (May 2023)	Human Health: Selected Human Health Screening Level	Final Site Characterization PAL[1]
Vanadium	7440-62-2	µg/g	--	--	--	--	56600	56600	56600
Vinyl acetate	108-05-4	µg/g	0.0057	--	--	0.0057	11200000	11200000	0.0057
Vinyl chloride	75-01-4	µg/g	0.482	--	--	0.482	54.6	54.6	0.482
Xylene, m-	108-38-3	µg/g	--	--	--	--	2250000	2250000	2250000
Xylene, m,p-	XYLMP	µg/g	--	--	0.252	0.252	--	--	0.252
Xylene, o-	95-47-6	µg/g	--	--	0.252	0.252	2250000	2250000	0.252
Xylene, p-	106-42-3	µg/g	--	--	--	--	2250000	2250000	2250000
Xylenes, total	1330-20-7	µg/g	0.13	--	--	0.13	2250000	2250000	0.13
Zinc	7440-66-6	µg/g	121	121	121	121	3370000	3370000	121

Notes:

BTAG = Biological Technical Assistance Group

PAL = Project Action Level

RSL = Regional Screening Level

The selected ecological screening level is the first available screening level according to the following hierarchy: USEPA Region 4 Ecological Screening Level, USEPA Region 5 Ecological Screening Level, USEPA Region 3 BTAG.

The selected human health screening level is the USEPA Sediment RSL for a recreational scenario.

[1] The Final Site Characterization PAL is the lower of the selected ecological screening level and selected human health screening level.

Appendix G
Site Summary Tables: Analytical Results from 2018–2020 Investigations

Appendix G

Complete 2018-2020 Groundwater Analytical Results: East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.24	µg/L	J	0.21	1
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.32	µg/L		0.12	0.21
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.52
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	RDX	121-82-4	RDX	0.42	µg/L	U	0.42	0.42
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	EBP-MW13	EBP-MW13-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	ACE	67-64-1	Acetone	2.7	µg/L	J	1.9	10
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
East Burn Pads	EBP-MW13	EBP-MW13-R0319	3/25/2019	WG	N	50	60	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.51
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	EBP-MW15	EBP-MW15-0319	3/7/2019	WG	N	27	37	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51

Appendix G

Complete 2018-2020 Groundwater Analytical Results: East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.51
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	RDX	121-82-4	RDX	0.36	µg/L	J	0.16	0.41
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.25
East Burn Pads	EBP-MW16	EBP-MW16-0319	3/7/2019	WG	N	25	35	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.41
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	UJ	0.41	0.41
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.51
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.51
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
East Burn Pads	EBP-MW17	EBP-MW17-0319	3/25/2019	WG	N	40	50	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.51
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.52
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
East Burn Pads	EBP-MW2	EBP-MW2-0319	3/7/2019	WG	N	133.5	143.5	Metals	SW6020	AS	7440-38-2	Arsenic	6.1	µg/L	J	4	10
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	HMX	2691-41-0	HMX	18	µg/L		0.21	0.41
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	MNX	5755-27-1	MNX	1	µg/L		0.3	0.51
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	RDX	121-82-4	RDX	17	µg/L		0.41	0.41

Appendix G

Complete 2018-2020 Groundwater Analytical Results: East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW3	EBP-MW3-0319	3/6/2019	WG	N	14.5	24.5	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	HMX	2691-41-0	HMX	18	µg/L		0.21	0.41
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	MNX	5755-27-1	MNX	1	µg/L		0.3	0.51
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	RDX	121-82-4	RDX	17	µg/L		0.41	0.41
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW3	EBP-MWF3-0319	3/6/2019	WG	FD	14.5	24.5	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.2	µg/L	U	0.2	0.3
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.3
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.2	µg/L	U	0.2	0.3
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	1
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	1
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.2	µg/L	U	0.2	1
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.4	µg/L	U	0.4	1
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	2
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.2	µg/L	U	0.2	1
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	2
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	DNX	DNX	DNX	0.46	µg/L	J	0.096	1
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	HMX	2691-41-0	HMX	4.7	µg/L		0.2	0.3
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	MNX	5755-27-1	MNX	1	µg/L		1	1
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.3
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	RDX	121-82-4	RDX	47	µg/L		1	1.5
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	1
East Burn Pads	EBP-MW4	EBP-MW4-0718	7/12/2018	WG	N	34.5	44.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.4	µg/L	U	0.4	2
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.2	µg/L	U	0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.2	µg/L	U	0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.25
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.25
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.2	µg/L	U	0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.39	µg/L	U	0.39	0.98
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	U	0.39	0.98
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.2	µg/L	U	0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.98
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	DNX	DNX	DNX	0.2	µg/L	U	0.2	0.98
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	HMX	2691-41-0	HMX	1.4	µg/L		0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	MNX	5755-27-1	MNX	0.14	µg/L	J	0.055	0.98
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	RDX	121-82-4	RDX	3.3	µg/L		0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.29
East Burn Pads	EBP-MW5	EBP-MW5-0718	7/12/2018	WG	N	35	45	Explosives	SW8330B	TNX	13980-04-6	TNX	0.39	µg/L	U	0.39	0.98
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.42	µg/L	U	0.42	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.52
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	RDX	121-82-4	RDX	0.42	µg/L	U	0.42	0.42
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	EBP-MW6	EBP-MW6-0319	3/7/2019	WG	N	65.1	75.1	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.4
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
East Burn Pads	EBP-MW7	EBP-MW7-0319	3/7/2019	WG	N	45	55	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.51
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
East Burn Pads	EBP-MW9	EBP-MW9-0319	3/8/2019	WG	N	50	60	Metals	SW6020	AS	7440-38-2	Arsenic	6.4	µg/L	J	4	10
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.43	µg/L	U	0.43	1.1
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.43
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.43	µg/L	U	0.43	0.43
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.43
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21

Appendix G

Complete 2018-2020 Groundwater Analytical Results: East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.43
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.43	µg/L	U	0.43	0.43
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.43	µg/L	U	0.43	1.1
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	DNX	DNX	DNX	0.27	µg/L	U	0.27	0.53
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.43
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	MNX	5755-27-1	MNX	0.31	µg/L	U	0.31	0.53
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.43
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	RDX	121-82-4	RDX	0.43	µg/L	U	0.43	0.43
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.26
East Burn Pads	EDA-1	EDA-1-0319	3/8/2019	WG	N	16	25.8	Explosives	SW8330B	TNX	13980-04-6	TNX	0.27	µg/L	U	0.27	0.53
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.42	µg/L	U	0.42	1.1
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1.1
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	DNX	DNX	DNX	0.54	µg/L		0.26	0.53
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	HMX	2691-41-0	HMX	6	µg/L	J	0.21	0.42
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	MNX	5755-27-1	MNX	0.85	µg/L		0.31	0.53
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	RDX	121-82-4	RDX	13	µg/L		0.42	0.42
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.53
East Burn Pads	EDA-2	EDA-2-0319	3/6/2019	WG	N	17.8	27.4	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.1	µg/L	U	0.1	0.15
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.1	µg/L	U	0.1	0.15
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.1	µg/L	U	0.1	0.15
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.1	µg/L	U	0.1	0.13
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.1	µg/L	U	0.1	0.13
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.1	µg/L	U	0.1	0.15
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.5
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.2	µg/L	U	0.2	0.5
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.1	µg/L	U	0.1	0.15
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.2	µg/L	U	0.2	0.5
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	DNX	DNX	DNX	0.1	µg/L	U	0.1	0.5
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	HMX	2691-41-0	HMX	73	µg/L		20	20
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	MNX	5755-27-1	MNX	0.1	µg/L	U	0.1	0.5
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.1	µg/L	U	0.1	0.15
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	RDX	121-82-4	RDX	0.31	µg/L		0.1	0.15
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.1	µg/L	U	0.1	0.15
East Burn Pads	EDA-4	EDA-4-0618	6/24/2018	WG	N	9.4	18.4	Explosives	SW8330B	TNX	13980-04-6	TNX	0.2	µg/L	U	0.2	0.5
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.22	µg/L	U	0.22	0.23
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.11	µg/L	U	0.11	0.12
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.11	µg/L	U	0.11	0.12
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.089	µg/L	U	0.089	0.11
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.089	µg/L	U	0.089	0.11
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.11	µg/L	U	0.11	0.12
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.22	µg/L	U	0.22	0.23
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.45	µg/L	U	0.45	0.45
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.17

Appendix G

Complete 2018-2020 Groundwater Analytical Results: East Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.45	µg/L	U	0.45	0.46
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	DNX	DNX	DNX	0.28	µg/L	U	0.28	0.56
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	HMX	2691-41-0	HMX	0.22	µg/L	U	0.22	0.23
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	MNX	5755-27-1	MNX	0.32	µg/L	U	0.32	0.56
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.22	µg/L	U	0.22	0.23
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	RDX	121-82-4	RDX	0.22	µg/L	U	0.22	0.23
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.11	µg/L	U	0.11	0.12
East Burn Pads	JAW-06R	JAW-06R-0620	6/10/2020	WG	N	18	28	Explosives	SW8330B	TNX	13980-04-6	TNX	0.28	µg/L	U	0.28	0.56
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.42	µg/L	U	0.42	1.1
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1.1
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.53
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.42
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	MNX	5755-27-1	MNX	0.31	µg/L	U	0.31	0.53
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	RDX	121-82-4	RDX	0.42	µg/L	U	0.42	0.42
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
East Burn Pads	JAW-07	JAW-07-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.53

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.42	µg/L	U	0.42	1
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	HMX	2691-41-0	HMX	1.1	µg/L		0.21	0.42
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.52
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	RDX	121-82-4	RDX	2	µg/L		0.42	0.42
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
West Burn Pads Area	G-30	G-30-0319	3/8/2019	WG	N	7	17	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.18	µg/L	J	0.16	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.19	µg/L	U	0.4	3
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	G-30	G-30-R0319	3/23/2019	WG	N	7	17	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	J	0.059	0.2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNX	DNX	DNX	0.76	µg/L	J	0.26	0.51
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	HMX	2691-41-0	HMX	450	µg/L		20	41
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	MNX	5755-27-1	MNX	2.4	µg/L		0.3	0.51
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	RDX	121-82-4	RDX	35	µg/L	J	16	41
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.25
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Metals	SW6020	BA	7440-39-3	Barium	260	µg/L		1.8	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	6.1	µg/L	J	0.4	3
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.33	µg/L	J	0.31	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.17	µg/L	J	0.16	1
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	JAW-23	JAW-23-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNX	DNX	DNX	0.18	µg/L	J	0.097	0.5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	HMX	2691-41-0	HMX	5.2	µg/L		0.2	0.4
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	MNX	5755-27-1	MNX	0.31	µg/L	J	0.092	0.5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	RDX	121-82-4	RDX	1.2	µg/L		0.4	0.4
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Metals	SW6020	BA	7440-39-3	Barium	160	µg/L		1.8	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	1200	µg/L		4	30
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.36	µg/L	J	0.22	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	3.9	µg/L		0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	1.3	µg/L		0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	23	µg/L		0.8	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.64	µg/L	J	0.16	1
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-24	JAW-24-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.11	µg/L	J	0.058	0.2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	HMX	2691-41-0	HMX	370	µg/L		10	20
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	MNX	5755-27-1	MNX	0.74	µg/L	J	0.29	0.5
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	RDX	121-82-4	RDX	15	µg/L		0.4	0.4
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.16	µg/L	J	0.16	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-25	JAW-25-0319	3/19/2019	WG	N	9	19	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.058	µg/L	J	0.058	0.2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	DNX	DNX	DNX	0.38	µg/L	J	0.098	0.5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	HMX	2691-41-0	HMX	8.1	µg/L		0.2	0.4
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	MNX	5755-27-1	MNX	0.24	µg/L	J	0.094	0.5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	RDX	121-82-4	RDX	4.8	µg/L		0.4	0.4
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-68-1219	12/19/2019	WG	N	8	18	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	UJ	0.39	0.97
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.19	µg/L	UJ	0.19	0.39
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	UJ	0.39	0.39
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.19	µg/L	UJ	0.19	0.39
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.19	µg/L	UJ	0.19	0.19
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	UJ	0.12	0.19
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.19	µg/L	UJ	0.19	0.39
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	UJ	0.39	0.39
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	UJ	0.12	0.19
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	UJ	0.39	0.97
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	DNX	DNX	DNX	0.36	µg/L	J	0.095	0.49
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	HMX	2691-41-0	HMX	7.9	µg/L	J	0.19	0.39
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	MNX	5755-27-1	MNX	0.22	µg/L	J	0.09	0.49
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.19	µg/L	UJ	0.19	0.39
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	RDX	121-82-4	RDX	4.4	µg/L	J	0.39	0.39
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.19	µg/L	UJ	0.19	0.23
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	Explosives	SW8330B	TNX	13980-04-6	TNX	0.24	µg/L	UJ	0.24	0.49
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	JAW-68	JAW-FD01-121919	12/19/2019	WG	FD	8	18	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.42	µg/L	U	0.42	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	HMX	2691-41-0	HMX	0.86	µg/L	J	0.21	0.42
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	MNX	5755-27-1	MNX	0.24	µg/L	J	0.097	0.52
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	RDX	121-82-4	RDX	4.1	µg/L		0.42	0.42
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	µg/L	J	0.18	3
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.2	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.28	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-99-1	WBP-99-1-0319	3/9/2019	WG	N	25	35	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.22	µg/L	J	0.2	0.98
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.074	µg/L	J	0.05	0.2
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.23	µg/L	J	0.12	0.2
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.49
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	HMX	2691-41-0	HMX	12	µg/L		0.2	0.39
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	MNX	5755-27-1	MNX	1.3	µg/L		0.28	0.49
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	RDX	121-82-4	RDX	37	µg/L		3.9	3.9
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	Explosives	SW8330B	TNX	13980-04-6	TNX	0.16	µg/L	J	0.078	0.49
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	80	µg/L	U	80	100

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	20000	µg/L		40	300
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	79	µg/L	J	23	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	80	µg/L	U	80	300
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	160	µg/L	U	160	500
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	20	µg/L	U	20	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	400	µg/L	U	400	500
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	ACE	67-64-1	Acetone	470	µg/L	J	190	1000
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BZ	71-43-2	Benzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	20	µg/L	U	20	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TBME	75-25-2	Bromoform	100	µg/L	U	100	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BRME	74-83-9	Bromomethane	80	µg/L	U	80	200
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	80	µg/L	U	80	200
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	40	µg/L	U	40	200
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CLME	74-87-3	Chloro methane	80	µg/L	U	80	200
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	160	µg/L	U	160	200
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TCLME	67-66-3	Chloroform	21	µg/L	J	16	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	80	µg/L	U	80	200
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	400	µg/L	U	400	600
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	320	µg/L	U	320	500
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	80	µg/L	U	80	500
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	200	µg/L	U	200	500
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	STY	100-42-5	Styrene	80	µg/L	U	80	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	BZME	108-88-3	Toluene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	40	µg/L	U	40	100

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	80	µg/L	U	80	200
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	20	µg/L	U	20	150
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	80	µg/L	U	80	200
West Burn Pads Area	WBP-99-2	WBP-99-2-0319	3/19/2019	WG	N	15	25	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	40	µg/L	U	40	100
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.41
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	HMX	2691-41-0	HMX	13	µg/L	J	0.2	0.41
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.51
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	RDX	121-82-4	RDX	13	µg/L		0.41	0.41
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.25
West Burn Pads Area	WBP-99-4	WBP-99-4-0319	3/22/2019	WG	N	19	24	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	3.2	µg/L	J	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	37000	µg/L	J	160	1200
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.58	µg/L	J	0.22	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	2.7	µg/L	J	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.64	µg/L	J	0.16	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.58	µg/L	J	0.2	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BZ	71-43-2	Benzene	0.17	µg/L	J	0.16	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.87	µg/L	J	0.15	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.7	µg/L	J	0.16	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.22	µg/L	J	0.19	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	8.1	µg/L	J	4	6
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.67	µg/L	J	0.14	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.28	µg/L	J	0.16	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.52	µg/L	J	0.17	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	BZME	108-88-3	Toluene	6	µg/L	J	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.77	µg/L	J	0.16	1
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	2.1	µg/L	J	0.8	2
West Burn Pads Area	WBP-99-5	WBP-99-5-R0319	3/23/2019	WG	N	10	20	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	1.7	µg/L	J	0.4	1
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.52
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Metals	SW6020	AS	7440-38-2	Arsenic	37	µg/L		8	10
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Metals	SW6020	BA	7440-39-3	Barium	960	µg/L	J	1.8	2
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
West Burn Pads Area	WBP-99-5	WPB-99-5-0319	3/7/2019	WG	N	10	20	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	UJ	0.41	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	UJ	0.2	0.41
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	UJ	0.41	0.41
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	UJ	0.2	0.41
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.34	µg/L	J	0.2	0.2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	UJ	0.12	0.2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.41
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	UJ	0.41	0.41
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	UJ	0.41	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	DNX	DNX	DNX	0.3	µg/L	J	0.099	0.51
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	UJ	0.2	0.41
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	UJ	0.29	0.51
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	UJ	0.2	0.41
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	UJ	0.41	0.41
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	UJ	0.2	0.24
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	Explosives	SW8330B	TNX	13980-04-6	TNX	1.6	µg/L	J	0.25	0.51
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	1.6	µg/L	J	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	180000	µg/L	J	800	6000
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	3.9	µg/L	J	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	1.3	µg/L	J	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.7	µg/L	J	0.2	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BZ	71-43-2	Benzene	0.47	µg/L	J	0.16	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BRME	74-83-9	Bromomethane	1.3	µg/L	J	0.21	2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	68	µg/L	J	0.8	2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	1.9	µg/L	J	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.36	µg/L	J	0.19	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.93	µg/L	J	0.14	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.61	µg/L	J	0.16	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.69	µg/L	J	0.17	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	BZME	108-88-3	Toluene	8.1	µg/L	J	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.26	µg/L	J	0.16	1
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	2.9	µg/L	J	0.8	2
West Burn Pads Area	WBP-99-6	WBP-99-6-0319	3/22/2019	WG	N	30	40	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	2.8	µg/L	J	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	UJ	0.39	0.98
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	UJ	0.2	0.39
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	UJ	0.39	0.39
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	UJ	0.2	0.39
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	UJ	0.2	0.2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	UJ	0.12	0.2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.39
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	UJ	0.39	0.39
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	UJ	0.12	0.2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	UJ	0.39	0.98
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	UJ	0.25	0.49
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	UJ	0.2	0.39
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.28	µg/L	UJ	0.28	0.49
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	UJ	0.2	0.39
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	RDX	121-82-4	RDX	0.39	µg/L	UJ	0.39	0.39
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	UJ	0.2	0.24
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.49
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Metals	SW6020	BA	7440-39-3	Barium	15	µg/L		1.8	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	1.1	µg/L	U	0.4	3
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW1	WBP-MW1-0319	3/23/2019	WG	N	35.5	45.5	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Metals	SW6020	BA	7440-39-3	Barium	18	µg/L		1.8	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Metals	SW6020	PB	7439-92-1	Lead	1.1	µg/L	J	1	3
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.84	µg/L	J	0.18	3
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW2	WBP-MW2-0319	3/22/2019	WG	N	30.5	40.5	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.39
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	UJ	0.39	0.39
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.49
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	MNX	5755-27-1	MNX	0.28	µg/L	U	0.28	0.49
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	RDX	121-82-4	RDX	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.49
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	300	µg/L	J	2	15
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.21	µg/L	J	0.17	2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW3	WBP-MW3-0319	3/23/2019	WG	N	40.4	50.4	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.11	µg/L	U	0.11	0.12
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.11	µg/L	U	0.11	0.12
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.084	µg/L	U	0.084	0.11
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.084	µg/L	U	0.084	0.11
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.11	µg/L	U	0.11	0.12
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.16
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	0.43
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.53
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	MNX	5755-27-1	MNX	0.31	µg/L	U	0.31	0.53
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	RDX	121-82-4	RDX	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.11	µg/L	U	0.11	0.12
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.53
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW6	FD03-050620	5/7/2020	WG	FD	29	39	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.1	µg/L	U	0.1	0.11
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.1	µg/L	U	0.1	0.11
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.082	µg/L	U	0.082	0.1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.082	µg/L	U	0.082	0.1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.1	µg/L	U	0.1	0.11
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.15
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	0.42
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.52
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	RDX	121-82-4	RDX	0.21	µg/L	U	0.21	0.22
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.1	µg/L	U	0.1	0.11
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW6	WBP-MW6-0520	5/7/2020	WG	N	29	39	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.39
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	UJ	0.39	0.39
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	DNX	DNX	DNX	0.24	µg/L	U	0.24	0.49
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	HMX	2691-41-0	HMX	55	µg/L		2	3.9
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	MNX	5755-27-1	MNX	0.2	µg/L	J	0.091	0.49
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	RDX	121-82-4	RDX	3.2	µg/L		0.39	0.39
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	Explosives	SW8330B	TNX	13980-04-6	TNX	0.24	µg/L	U	0.24	0.49
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	8800	µg/L	J	40	300
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-MW8	WBP-MW8-0319	3/23/2019	WG	N	32	42	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.4
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	UJ	0.4	0.4
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Metals	SW6020	BA	7440-39-3	Barium	130	µg/L		1.8	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Metals	SW6020	PB	7439-92-1	Lead	1.2	µg/L	J	1	3
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	1.3	µg/L	J	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	30000	µg/L	J	160	1200
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	1.9	µg/L	J	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.58	µg/L	J	0.16	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.31	µg/L	J	0.19	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.56	µg/L	J	0.2	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TCLME	67-66-3	Chloroform	2.1	µg/L	J	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.43	µg/L	J	0.16	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	J	0.14	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.23	µg/L	J	0.16	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.49	µg/L	J	0.17	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	BZME	108-88-3	Toluene	1.2	µg/L	J	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	1.1	µg/L	J	0.15	2
West Burn Pads Area	WBP-MW9	WBP-MW9-0319	3/23/2019	WG	N	70	80	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.62	µg/L	J	0.19	1
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.52
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	4600	µg/L		40	300
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	29	µg/L		16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	16	µg/L	U	16	60
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	32	µg/L	U	32	100
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	4	µg/L	U	4	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	80	µg/L	U	80	100
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	ACE	67-64-1	Acetone	130	µg/L	U	130	200

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BZ	71-43-2	Benzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	4	µg/L	U	4	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TBME	75-25-2	Bromoform	20	µg/L	U	20	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BRME	74-83-9	Bromomethane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	8	µg/L	U	8	40
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CLME	74-87-3	Chloro methane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TCLME	67-66-3	Chloroform	6.7	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	230	µg/L		16	40
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	80	µg/L	U	80	120
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	64	µg/L	U	64	100
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	16	µg/L	U	16	100
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	40	µg/L	U	40	100
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	STY	100-42-5	Styrene	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	BZME	108-88-3	Toluene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	4	µg/L	U	4	30
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-01	WBP-TTMW-01-0319	3/7/2019	WG	N	1	5.11	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.51	µg/L	J	0.12	0.2
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	1.1	µg/L	J	0.12	0.2
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	DNX	DNX	DNX	4.7	µg/L	J	0.26	0.51
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	HMX	2691-41-0	HMX	170	µg/L		2	4.1
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	MNX	5755-27-1	MNX	1.7	µg/L		0.3	0.51
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	RDX	121-82-4	RDX	51	µg/L		4.1	4.1
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.25
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	32	µg/L	U	32	40

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	5900	µg/L		40	300
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	32	µg/L	U	32	120
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	64	µg/L	U	64	200
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	8	µg/L	U	8	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	160	µg/L	U	160	200
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	ACE	67-64-1	Acetone	260	µg/L	U	260	400
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BZ	71-43-2	Benzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	8	µg/L	U	8	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TBME	75-25-2	Bromoform	40	µg/L	U	40	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BRME	74-83-9	Bromomethane	32	µg/L	U	32	80
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	32	µg/L	U	32	80
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	16	µg/L	U	16	80
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CLME	74-87-3	Chloro methane	32	µg/L	U	32	80
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	64	µg/L	U	64	80
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TCLME	67-66-3	Chloroform	12	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	79	µg/L	J	12	80
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	160	µg/L	U	160	240
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	130	µg/L	U	130	200
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	32	µg/L	U	32	200
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	80	µg/L	U	80	200
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	STY	100-42-5	Styrene	32	µg/L	U	32	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	16	µg/L	U	16	40

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	BZME	108-88-3	Toluene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	32	µg/L	U	32	80
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	8	µg/L	U	8	60
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	32	µg/L	U	32	80
West Burn Pads Area	WBP-TTMW-02	WBP-TTMW-02-0319	3/7/2019	WG	N	1	6.5	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	16	µg/L	U	16	40
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	0.99
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.26	µg/L	J	0.12	0.2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	0.99
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	DNX	DNX	DNX	0.43	µg/L	J	0.097	0.5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	HMX	2691-41-0	HMX	54	µg/L		2	4
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.98	µg/L		0.29	0.5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	RDX	121-82-4	RDX	12	µg/L		0.4	0.4
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Metals	SW6020	BA	7440-39-3	Barium	640	µg/L		1.8	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Metals	SW6020	CD	7440-43-9	Cadmium	0.63	µg/L		0.4	0.5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.27	µg/L	J	0.22	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	µg/L		16	120
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.37	µg/L	J	0.22	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	11	µg/L		0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.29	µg/L	J	0.15	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	ACE	67-64-1	Acetone	92	µg/L		6.4	10
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.49	µg/L	J	0.15	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	140	µg/L		0.8	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	BZME	108-88-3	Toluene	0.41	µg/L	J	0.17	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.77	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.24	µg/L	J	0.15	2
West Burn Pads Area	WBP-TTMW-03	WBP-TTMW-03-0319	3/22/2019	WG	N	3.5	8.5	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.25	µg/L	J	0.19	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.42	µg/L	U	0.42	1.1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1.1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.53
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	HMX	2691-41-0	HMX	0.55	µg/L	J	0.21	0.42
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.53
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	RDX	121-82-4	RDX	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.53
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	210	µg/L		2	15
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	J	0.23	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.15	µg/L	J	0.15	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	ACE	67-64-1	Acetone	7.8	µg/L	J	1.9	10
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BZ	71-43-2	Benzene	0.21	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.35	µg/L	J	0.15	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	67	µg/L		0.8	2
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	BZME	108-88-3	Toluene	3.1	µg/L		0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.2	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-04	WBP-TTMW-04-0319	3/22/2019	WG	N	6	11	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	0.99
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.4
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	UJ	0.4	0.4
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	0.99
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	HMX	2691-41-0	HMX	2.6	µg/L		0.2	0.4
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.63	µg/L	U	0.4	3
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-05B	WBP-TTMW-05B-0319	3/23/2019	WG	N	1.4	6.4	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.068	µg/L	J	0.051	0.2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.4
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	UJ	0.4	0.4
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	DNX	DNX	DNX	0.33	µg/L	J	0.098	0.5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	HMX	2691-41-0	HMX	29	µg/L		2	4
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	MNX	5755-27-1	MNX	4	µg/L		0.29	0.5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	RDX	121-82-4	RDX	120	µg/L		4	4
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Explosives	SW8330B	TNX	13980-04-6	TNX	3.1	µg/L		0.25	0.5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Metals	SW6020	BA	7440-39-3	Barium	91	µg/L		1.8	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Metals	SW6020	SE	7782-49-2	Selenium	2.8	µg/L	J	2	5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/23/2019	WG	N	3	8	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.43	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	12000	µg/L	J	40	300
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	1	µg/L	J	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	47	µg/L	J	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	ACE	67-64-1	Acetone	380	µg/L	J	6.4	10
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BRME	74-83-9	Bromomethane	3.8	µg/L	J	0.8	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CLME	74-87-3	Chloro methane	2.9	µg/L	J	0.8	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.33	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	9.6	µg/L	J	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	69	µg/L	J	0.8	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	13	µg/L	J	0.4	1
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-06	WBP-TTMW-06-0319	3/24/2019	WG	N	3	8	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.51
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	HMX	2691-41-0	HMX	11	µg/L		0.2	0.41
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.51
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	RDX	121-82-4	RDX	0.51	µg/L		0.41	0.41
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.51
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	52	µg/L		0.4	3
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.24	µg/L	J	0.23	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	10	µg/L		0.8	2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
West Burn Pads Area	WBP-TTMW-08	WBP-TTMW-08-0319	3/22/2019	WG	N	5	10	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	0.99
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.4
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	UJ	0.4	0.4
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	0.99
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	HMX	2691-41-0	HMX	7.2	µg/L		0.2	0.4

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	540	µg/L	J	4	30
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-10	WBP-TTMW-10-0319	3/23/2019	WG	N	7.2	12.2	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	2.5	µg/L	J	0.2	0.4
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	1	µg/L	J	0.2	0.2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.4
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	UJ	0.4	0.4
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	DNX	DNX	DNX	23	µg/L	J	0.25	0.5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	HMX	2691-41-0	HMX	91	µg/L		20	40
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	MNX	5755-27-1	MNX	30	µg/L	J	0.092	0.5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	RDX	121-82-4	RDX	850	µg/L		40	40
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	1.7	µg/L	J	0.2	0.24
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	Explosives	SW8330B	TNX	13980-04-6	TNX	20	µg/L	J	0.25	0.5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.61	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	25000	µg/L	J	80	600
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	3.5	µg/L	J	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BZ	71-43-2	Benzene	0.18	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BRME	74-83-9	Bromomethane	5.6	µg/L	J	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CLME	74-87-3	Chloro methane	4	µg/L	J	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.51	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	57	µg/L	J	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.5	µg/L	J	0.15	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	54	µg/L	J	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-11-0319	3/22/2019	WG	N	6.7	21.7	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.99
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	2.8	µg/L	J	0.2	0.39
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.82	µg/L	J	0.2	0.2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.39
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	UJ	0.39	0.39
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.99
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	DNX	DNX	DNX	36	µg/L	J	0.096	0.49
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	HMX	2691-41-0	HMX	87	µg/L		20	39
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	MNX	5755-27-1	MNX	33	µg/L	J	0.091	0.49
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	RDX	121-82-4	RDX	940	µg/L		39	39

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	1.2	µg/L	J	0.2	0.24
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	Explosives	SW8330B	TNX	13980-04-6	TNX	23	µg/L	J	0.25	0.49
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.65	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	28000	µg/L	J	80	600
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	3.3	µg/L	J	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BZ	71-43-2	Benzene	0.19	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BRME	74-83-9	Bromomethane	8.4	µg/L	J	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CLME	74-87-3	Chloro methane	6.2	µg/L	J	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.51	µg/L	J	0.16	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	56	µg/L	J	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.5	µg/L	J	0.15	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	53	µg/L	J	0.4	1
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
West Burn Pads Area	WBP-TTMW-11	WBP-TTMW-F11-0319	3/22/2019	WG	FD	6.7	21.7	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.43	µg/L	J	0.12	0.2
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.41	µg/L	J	0.12	0.2
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	DNX	DNX	DNX	0.39	µg/L	J	0.096	0.49
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	HMX	2691-41-0	HMX	58	µg/L		3.9	7.9
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	MNX	5755-27-1	MNX	2.7	µg/L		0.28	0.49
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	RDX	121-82-4	RDX	87	µg/L		7.9	7.9
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-TTMW-12	WBP-TTMW-12-0319	3/19/2019	WG	N	7.8	17.8	Explosives	SW8330B	TNX	13980-04-6	TNX	13	µg/L		0.25	0.49
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.98
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.49
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.49
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	RDX	121-82-4	RDX	0.39	µg/L	U	0.39	0.39
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-TTMW-13	WBP-TTMW-13-0319	3/19/2019	WG	N	4.2	14.2	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.49
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.42	µg/L	J	0.12	0.2
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.6	µg/L		0.12	0.2
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	DNX	DNX	DNX	0.33	µg/L	J	0.097	0.5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	HMX	2691-41-0	HMX	52	µg/L		4	8
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	MNX	5755-27-1	MNX	3.7	µg/L		0.29	0.5
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	RDX	121-82-4	RDX	140	µg/L		8	8
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	710	µg/L		4	30
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	4.2	µg/L	J	2.3	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	8	µg/L	U	8	30
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	16	µg/L	U	16	50
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	2	µg/L	U	2	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	40	µg/L	U	40	50
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	ACE	67-64-1	Acetone	19	µg/L	J	19	100
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BZ	71-43-2	Benzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	2	µg/L	U	2	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TBME	75-25-2	Bromoform	10	µg/L	U	10	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BRME	74-83-9	Bromomethane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	4	µg/L	U	4	20
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CLME	74-87-3	Chloro methane	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	16	µg/L	U	16	20
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TCLME	67-66-3	Chloroform	2.2	µg/L	J	1.6	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	2.1	µg/L	J	1.5	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	3.6	µg/L	J	3.1	20
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	40	µg/L	U	40	60
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	32	µg/L	U	32	50
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	8	µg/L	U	8	50

Appendix G

Complete 2018-2020 Groundwater Analytical Results: West Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	20	µg/L	U	20	50
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	STY	100-42-5	Styrene	8	µg/L	U	8	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	BZME	108-88-3	Toluene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	2.1	µg/L	J	1.6	10
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	2	µg/L	U	2	15
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	8	µg/L	U	8	20
West Burn Pads Area	WBP-TTMW-14	WBP-TTMW-14-0319	3/19/2019	WG	N	5.8	15.8	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	4	µg/L	U	4	10
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.42	µg/L	U	0.42	1
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.54	µg/L		0.13	0.21
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.51	µg/L	J	0.13	0.21
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	DNX	DNX	DNX	0.14	µg/L	J	0.1	0.52
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	HMX	2691-41-0	HMX	56	µg/L		2.1	4.2
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	MNX	5755-27-1	MNX	1.1	µg/L		0.3	0.52
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	RDX	121-82-4	RDX	40	µg/L		4.2	4.2
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.16	µg/L	J	0.083	0.25
West Burn Pads Area	WBP-TTMW-15	WBP-TTMW-15-0319	3/9/2019	WG	N	12.8	22.8	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52

Appendix G

Complete 2018-2020 Groundwater Analytical Results: North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.4
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	UJ	0.4	0.4
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	HMX	2691-41-0	HMX	0.088	µg/L	J	0.088	0.4
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
North Burn Pads	JAW-11	JAW-11-0319	3/24/2019	WG	N	19	29	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
North Burn Pads	JAW-12	JAW-12-0319	3/24/2019	WG	N	13	21	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.99
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.39
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.39
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	U	0.39	0.39
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.99
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.49
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.39
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.49
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	RDX	121-82-4	RDX	0.39	µg/L	U	0.39	0.39
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.49
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	2000	µg/L		20	150
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.22	µg/L	J	0.21	2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.17	µg/L	J	0.16	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
North Burn Pads	JAW-13	JAW-13-0319	3/24/2019	WG	N	7	17	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	0.99
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4

Appendix G

Complete 2018-2020 Groundwater Analytical Results: North Burn Pads

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	0.99
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
North Burn Pads	JAW-14	JAW-14-0319	3/24/2019	WG	N	18	28	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.4
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	MNX	5755-27-1	MNX	0.1	µg/L	J	0.093	0.5
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
North Burn Pads	NBP-MW1	NBP-MW1-0319	3/24/2019	WG	N	15	25	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.11	µg/L	U	0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.11	µg/L	U	0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.11	µg/L	U	0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.11	µg/L	U	0.11	0.14
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.11	µg/L	U	0.11	0.14
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.11	µg/L	U	0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.53
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.21	µg/L	U	0.21	0.53
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.11	µg/L	U	0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.21	µg/L	U	0.21	0.53
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	DNX	DNX	DNX	0.11	µg/L	U	0.11	0.53
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	HMX	2691-41-0	HMX	1	µg/L		0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.11	µg/L	U	0.11	0.53
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.11	µg/L	U	0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	RDX	121-82-4	RDX	0.27	µg/L		0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.11	µg/L	U	0.11	0.16
North Burn Pads Landfill	JAW-626	JAW-626-0618	6/24/2018	WG	N	7.5	17.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.21	µg/L	U	0.21	0.53
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.1	µg/L	U	0.1	0.13
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.1	µg/L	U	0.1	0.13
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.5
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.2	µg/L	U	0.2	0.5
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.2	µg/L	U	0.2	0.5
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	DNX	DNX	DNX	0.1	µg/L	U	0.1	0.5
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	HMX	2691-41-0	HMX	7.9	µg/L		0.1	0.15
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.1	µg/L	U	0.1	0.5
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	RDX	121-82-4	RDX	14	µg/L		20	20
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	JAW-627	JAW-627-0618	6/25/2018	WG	N	27.5	37.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.2	µg/L	U	0.2	0.5
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.1	µg/L	U	0.1	0.13
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.1	µg/L	U	0.1	0.13
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.52
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.21	µg/L	U	0.21	0.52
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.21	µg/L	U	0.21	0.52
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	DNX	DNX	DNX	0.1	µg/L	U	0.1	0.52
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	HMX	2691-41-0	HMX	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	MNX	5755-27-1	MNX	0.1	µg/L	U	0.1	0.52
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	RDX	121-82-4	RDX	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.1	µg/L	U	0.1	0.15
North Burn Pads Landfill	NBPLF-MW1	NBPLF-MW1-0618	6/24/2018	WG	N	58	68	Explosives	SW8330B	TNX	13980-04-6	TNX	0.21	µg/L	U	0.21	0.52
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.98
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.39
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	UJ	0.2	0.39
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	UJ	0.39	0.39
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.98

Appendix G

Complete 2018-2020 Groundwater Analytical Results: North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.49
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.39
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	MNX	5755-27-1	MNX	0.28	µg/L	U	0.28	0.49
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	RDX	121-82-4	RDX	0.39	µg/L	U	0.39	0.39
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
North Burn Pads Landfill	NBPLF-MW3	NBPLF-MW3-0319	3/25/2019	WG	N	57	67	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.49
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.43	µg/L	U	0.43	1.1
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.43
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.43	µg/L	U	0.43	0.43
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.43
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.43
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.43	µg/L	U	0.43	0.43
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.43	µg/L	U	0.43	1.1
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	DNX	DNX	DNX	0.27	µg/L	U	0.27	0.53
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	HMX	2691-41-0	HMX	5.6	µg/L		0.21	0.43
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.14	µg/L	J	0.099	0.53
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.43
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	RDX	121-82-4	RDX	4.7	µg/L		0.43	0.43
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.26
North Burn Pads Landfill	NBPLF-MW4	NBPLF-MW4-0420	4/20/2020	WG	N	24.5	34.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.27	µg/L	U	0.27	0.53
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.1	µg/L	U	0.1	0.14
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.1	µg/L	U	0.1	0.14
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.52
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.21	µg/L	U	0.21	0.52
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.21	µg/L	U	0.21	0.52
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	DNX	DNX	DNX	0.1	µg/L	U	0.1	0.52
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	HMX	2691-41-0	HMX	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	MNX	5755-27-1	MNX	0.1	µg/L	U	0.1	0.52
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	RDX	121-82-4	RDX	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.1	µg/L	U	0.1	0.16
North Burn Pads Landfill	NBPLF-MW5	NBPLF-MW5-0618	6/24/2018	WG	N	39	49	Explosives	SW8330B	TNX	13980-04-6	TNX	0.21	µg/L	U	0.21	0.52
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	HMX	2691-41-0	HMX	2.8	µg/L		0.2	0.4
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	MNX	5755-27-1	MNX	1.6	µg/L	J	0.29	0.5
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	RDX	121-82-4	RDX	4.1	µg/L		0.4	0.4
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
North Burn Pads Landfill	NBPLF-MW6	NBPLF-MW6-0420	4/21/2020	WG	N	26.5	36.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.1	µg/L	U	0.1	0.15
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.056	µg/L	J	0.052	0.15
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	MNX	5755-27-1	1-Nitroso-3,5-dinitro-1,3,5-triazacyclohexane/ MNX	0.1	µg/L	U	0.1	0.52

Appendix G

Complete 2018-2020 Groundwater Analytical Results: North Burn Pads Landfill

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.1	µg/L	U	0.1	0.15
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.1	µg/L	U	0.1	0.13
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.1	µg/L	U	0.1	0.13
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.1	µg/L	U	0.1	0.15
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.52
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.21	µg/L	U	0.21	0.52
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.1	µg/L	U	0.1	0.15
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.21	µg/L	U	0.21	0.52
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	TNX	13980-04-6	Hexahydro-1,3,5-trinitroso-1,3,5-triazine/ TNX	0.21	µg/L	U	0.21	0.52
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	DNX	DNX	Hexahydro-1,3-dinitroso-5-dinitro-1,3,5-triazine	0.1	µg/L	U	0.1	0.52
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	HMX	2691-41-0	HMX	0.1	µg/L	U	0.1	0.15
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.1	µg/L	U	0.1	0.15
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	RDX	121-82-4	RDX	0.1	µg/L	U	0.1	0.15
Contaminated Waste Processor	CW-P	CW-P-0618	6/24/2018	WG	N	17	27	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.1	µg/L	U	0.1	0.15

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	RDX	121-82-4	RDX	0.36	µg/L	J	0.16	0.4
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.89	µg/L	J	0.16	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	1	µg/L	J	0.18	3
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.85	µg/L	J	0.22	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	2.7	µg/L		0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.45	µg/L	J	0.15	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.32	µg/L	J	0.16	1
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-1	FTA-99-1-0319	3/19/2019	WG	N	7	17	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.41
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.51
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-99-2	FTA-99-2-0319	3/21/2019	WG	N	40	50	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	Metals	SW6020	BA	7440-39-3	Barium	230	µg/L		1.8	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	3.1	µg/L	J	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.33	µg/L	J	0.15	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BZ	71-43-2	Benzene	4.9	µg/L	J	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	2.5	µg/L	J	1.6	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	1	µg/L	J	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	1.4	µg/L	J	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.22	µg/L	J	0.16	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	BZME	108-88-3	Toluene	0.18	µg/L	J	0.17	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.24	µg/L	J	0.1	1.5
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.19	µg/L	J	0.15	2
Fire Training Pit	FTA-TT-MW-01	FTA-TT-MW-01-0319	3/23/2019	WG	N	5	30	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	Metals	SW6020	AS	7440-38-2	Arsenic	46	µg/L	J	20	50
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	Metals	SW6020	BA	7440-39-3	Barium	2000	µg/L		9	10
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	Metals	SW6020	CD	7440-43-9	Cadmium	2	µg/L	U	2	2.5
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	Metals	SW6020	CR	7440-47-3	Chromium	40	µg/L	U	40	50
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	Metals	SW6020	PB	7439-92-1	Lead	10	µg/L	U	10	15
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	Metals	SW6020	SE	7782-49-2	Selenium	20	µg/L	U	20	25
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	Metals	SW6020	AG	7440-22-4	Silver	9	µg/L	U	9	10
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	Metals	SW7470A	HG	7439-97-6	Mercury	0.75	µg/L	U	0.75	1
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	16	µg/L	U	16	120
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	230	µg/L		32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	42	µg/L		32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	32	µg/L	U	32	120
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	34	µg/L	J	6	40

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	64	µg/L	U	64	200
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	33	µg/L	J	5.2	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	9.9	µg/L	J	6.4	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	8	µg/L	U	8	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	160	µg/L	U	160	200
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	ACE	67-64-1	Acetone	6700	µg/L		260	400
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BZ	71-43-2	Benzene	46	µg/L		16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	8	µg/L	U	8	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TBME	75-25-2	Bromoform	40	µg/L	U	40	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRME	74-83-9	Bromomethane	32	µg/L	UJ	32	80
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	32	µg/L	U	32	80
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	16	µg/L	U	16	80
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLME	74-87-3	Chloro methane	32	µg/L	U	32	80
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	130	µg/L		64	80
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCLME	67-66-3	Chloroform	6.6	µg/L	U	6.4	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	230	µg/L		16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	32	µg/L	U	32	80
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	40	µg/L		16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	5100	µg/L		160	240
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	1700	µg/L		130	200
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	32	µg/L	U	32	200
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	160	µg/L	J	38	200
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	STY	100-42-5	Styrene	32	µg/L	U	32	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BZME	108-88-3	Toluene	1900	µg/L		16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	16	µg/L	U	16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	59	µg/L		16	40
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	32	µg/L	U	32	80
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	53	µg/L	J	4	60
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	150	µg/L		32	80
Fire Training Pit	FTA-TT-MW-02	FTA-TT-MW-02-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	59	µg/L		16	40
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	Metals	SW6020	AS	7440-38-2	Arsenic	17	µg/L		8	10
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	Metals	SW6020	BA	7440-39-3	Barium	310	µg/L		1.8	2
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	2000	µg/L		40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	80	µg/L	U	80	100

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	40	µg/L	U	40	300
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	4900	µg/L		80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	270	µg/L		80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	80	µg/L	U	80	300
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	110	µg/L		40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	160	µg/L	U	160	500
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	81	µg/L	J	13	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	34	µg/L	J	16	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	20	µg/L	U	20	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	400	µg/L	U	400	500
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	ACE	67-64-1	Acetone	640	µg/L	U	640	1000
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BZ	71-43-2	Benzene	88	µg/L	J	16	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	20	µg/L	U	20	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TBME	75-25-2	Bromoform	100	µg/L	U	100	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRME	74-83-9	Bromomethane	80	µg/L	U	80	200
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	26	µg/L	J	17	200
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	40	µg/L	U	40	200
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLME	74-87-3	Chloro methane	80	µg/L	U	80	200
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1100	µg/L		160	200
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCLME	67-66-3	Chloroform	20	µg/L	U	16	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	2000	µg/L		40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	80	µg/L	U	80	200
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	130	µg/L		40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	400	µg/L	U	400	600
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	320	µg/L	U	320	500
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	80	µg/L	U	80	500
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	200	µg/L	U	200	500
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	STY	100-42-5	Styrene	80	µg/L	U	80	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	59	µg/L	J	20	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BZME	108-88-3	Toluene	3500	µg/L		40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	40	µg/L	U	40	100
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	80	µg/L	U	80	200
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	510	µg/L		20	150
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	570	µg/L		80	200
Fire Training Pit	FTA-TT-MW-03	FTA-TT-MW-03-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	210	µg/L		40	100
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	Metals	SW6020	AS	7440-38-2	Arsenic	26	µg/L		8	10
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	Metals	SW6020	BA	7440-39-3	Barium	350	µg/L		1.8	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	3.7	µg/L		0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.41	µg/L	J	0.15	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.24	µg/L	J	0.16	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	24	µg/L		0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	25	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	4.7	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.49	µg/L	J	0.2	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BZ	71-43-2	Benzene	45	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	250	µg/L		8	10
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	1.5	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	34	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	2.3	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	7.6	µg/L		2	5
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	3.8	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	1.2	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	BZME	108-88-3	Toluene	27	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.42	µg/L	J	0.15	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	2	µg/L		0.2	1.5
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	84	µg/L		0.8	2
Fire Training Pit	FTA-TT-MW-04	FTA-TT-MW-04-0319	3/21/2019	WG	N	7	32	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	14	µg/L		0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	1

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	HMX	2691-41-0	HMX	0.43	µg/L	J	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Metals	SW6020	BA	7440-39-3	Barium	320	µg/L		1.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.71	µg/L	J	0.22	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BZ	71-43-2	Benzene	0.98	µg/L	J	0.16	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.31	µg/L	J	0.16	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.17	µg/L	J	0.17	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-05-0319	3/21/2019	WG	N	5	30	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	0.99
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	0.99
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	HMX	2691-41-0	HMX	0.45	µg/L	J	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	RDX	121-82-4	RDX	0.4	µg/L	U	0.4	0.4
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Metals	SW6020	BA	7440-39-3	Barium	340	µg/L		1.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.68	µg/L	J	0.22	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BZ	71-43-2	Benzene	0.92	µg/L	J	0.16	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.27	µg/L	J	0.16	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTA-TT-MW-05	FTA-TT-MW-F05-0319	3/21/2019	WG	FD	5	30	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.51
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.41
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.51
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
Fire Training Pit	FTP-MW1	FTP-MW1-0319	3/8/2019	WG	N	5.5	15.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.51
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.58	µg/L	J	0.22	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW1	FTP-MW1-R0319	3/23/2019	WG	N	5.5	15.5	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.98

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.39
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.39
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.39
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	U	0.39	0.39
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.98
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.49
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	HMX	2691-41-0	HMX	0.34	µg/L	J	0.086	0.39
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	MNX	5755-27-1	MNX	0.28	µg/L	U	0.28	0.49
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.39
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	RDX	121-82-4	RDX	1.2	µg/L		0.39	0.39
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
Fire Training Pit	FTP-MW2	FTP-MW2-0319	3/8/2019	WG	N	6.9	16.9	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.49
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.95	µg/L	J	0.16	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.81	µg/L	J	0.22	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	3	µg/L		0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.54	µg/L	J	0.15	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.22	µg/L	J	0.16	1
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW2	FTP-MW2-R0319	3/23/2019	WG	N	6.9	16.9	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.42	µg/L	U	0.42	1.1
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.42
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.42	µg/L	U	0.42	0.42
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.42
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.42
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.42	µg/L	U	0.42	0.42
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.13	µg/L	U	0.13	0.21
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.42	µg/L	U	0.42	1.1
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.53
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	HMX	2691-41-0	HMX	0.21	µg/L	U	0.21	0.42
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	MNX	5755-27-1	MNX	0.31	µg/L	U	0.31	0.53
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.42
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	RDX	121-82-4	RDX	0.42	µg/L	U	0.42	0.42
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
Fire Training Pit	FTP-MW3	FTP-MW3-0319	3/8/2019	WG	N	10.5	20.5	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.53
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW3	FTP-MW3-R0319	3/23/2019	WG	N	10.5	20.5	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.97
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.19	µg/L	U	0.19	0.39
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.19	µg/L	U	0.19	0.39
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.19	µg/L	U	0.19	0.19
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.19
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.19	µg/L	UJ	0.19	0.39
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	UJ	0.39	0.39
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.19
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	UJ	0.39	0.97
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	DNX	DNX	DNX	0.24	µg/L	U	0.24	0.49
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	HMX	2691-41-0	HMX	0.19	µg/L	U	0.19	0.39
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	MNX	5755-27-1	MNX	0.28	µg/L	U	0.28	0.49
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.19	µg/L	UJ	0.19	0.39
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	RDX	121-82-4	RDX	0.39	µg/L	U	0.39	0.39
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.19	µg/L	U	0.19	0.23
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Explosives	SW8330B	TNX	13980-04-6	TNX	0.24	µg/L	U	0.24	0.49
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Metals	SW6020	BA	7440-39-3	Barium	42	µg/L		1.8	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW4	FTP-MW4-0319	3/21/2019	WG	N	49.1	59.1	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	23	µg/L	J	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.4	µg/L	J	0.27	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.72	µg/L	J	0.22	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	55	µg/L	J	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.64	µg/L	J	0.2	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW5	FTP-MW5-R0319	3/23/2019	WG	N	8.9	13.9	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.21	µg/L	U	0.18	3
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW6	FTP-MW6-R0319	3/24/2019	WG	N	34.8	44.8	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.8	µg/L	J	0.18	3
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW7	FTP-MW7-0319	3/9/2019	WG	N	11	21	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	FTP-MW8	FTP-MW8-0319	3/9/2019	WG	N	41.1	51.1	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	Metals	SW6020	BA	7440-39-3	Barium	93	µg/L	J	1.8	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.5	µg/L	J	0.16	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	1.4	µg/L	J	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.38	µg/L	J	0.2	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-58	JAW-58-0319	3/9/2019	WG	N	10	20	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.21	µg/L	U	0.21	0.41
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.21	µg/L	U	0.21	0.41
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.21	µg/L	U	0.21	0.21
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.21	µg/L	U	0.21	0.41
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.21
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.52
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	HMX	2691-41-0	HMX	0.24	µg/L	J	0.09	0.41
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.52
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.21	µg/L	U	0.21	0.41
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	RDX	121-82-4	RDX	1.4	µg/L		0.41	0.41
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.21	µg/L	U	0.21	0.25
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.52
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Metals	SW6020	BA	7440-39-3	Barium	160	µg/L	J	1.8	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	32	µg/L		0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	1.3	µg/L		0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	3.9	µg/L		0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	110	µg/L	J	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.82	µg/L	J	0.13	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.19	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	1.5	µg/L		0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	7	µg/L		0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.29	µg/L	J	0.16	1
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-59	JAW-59-0319	3/9/2019	WG	N	23	33	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	Metals	SW6020	BA	7440-39-3	Barium	280	µg/L		1.8	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	12	µg/L	J	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	2.5	µg/L	J	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.56	µg/L	J	0.18	3
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	140	µg/L	J	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	210	µg/L	J	4	5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	30	µg/L	J	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BZ	71-43-2	Benzene	0.87	µg/L	J	0.16	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	5.8	µg/L	J	1.6	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TCLME	67-66-3	Chloroform	1.8	µg/L	U	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	190	µg/L	J	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	1.9	µg/L	J	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.58	µg/L	J	0.15	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	37	µg/L	J	0.4	1
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	1.3	µg/L	J	0.1	1.5
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-60	JAW-60-0319	3/21/2019	WG	N	24	34	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	88	µg/L		0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.64	µg/L	J	0.27	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	18	µg/L		0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	83	µg/L		0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	1.7	µg/L		0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.79	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	37	µg/L		0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	24	µg/L		0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	82	µg/L		0.4	1
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-61	JAW-61-0319	3/21/2019	WG	N	8	18	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	Metals	SW6020	BA	7440-39-3	Barium	110	µg/L		1.8	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	Metals	SW6020	SE	7782-49-2	Selenium	4.3	µg/L	J	2	5
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-62	JAW-62-0319	3/21/2019	WG	N	9	19	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.4	µg/L	U	0.4	0.99
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.4	µg/L	U	0.4	0.4
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.4	µg/L	U	0.4	0.4
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.4	µg/L	U	0.4	0.99
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	DNX	DNX	DNX	0.25	µg/L	U	0.25	0.5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.4
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	MNX	5755-27-1	MNX	0.29	µg/L	U	0.29	0.5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.4
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	RDX	121-82-4	RDX	0.46	µg/L		0.4	0.4
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.24
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Explosives	SW8330B	TNX	13980-04-6	TNX	0.25	µg/L	U	0.25	0.5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Metals	SW6020	BA	7440-39-3	Barium	160	µg/L		1.8	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	U	0.8	1

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	U	0.4	3
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	U	0.8	3
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	U	1.6	5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	U	0.2	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	U	4	5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	U	6.4	10
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	U	0.2	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	U	1	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	U	0.4	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	U	1.6	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	U	4	6
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	U	3.2	5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	U	0.8	5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	U	2	5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	U	0.8	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	U	0.2	1.5
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	U	0.8	2
Fire Training Pit	JAW-63	JAW-63-0319	3/21/2019	WG	N	10	20	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	U	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.51
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.25
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Metals	SW6020	BA	7440-39-3	Barium	260	µg/L	J	1.8	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	7.5	µg/L	J	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.4	µg/L	UJ	0.4	3
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	6.5	µg/L	J	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	39	µg/L	J	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	1.6	µg/L	J	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.35	µg/L	J	0.16	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	6.3	µg/L	J	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.81	µg/L	J	0.2	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	2.8	µg/L	J	0.4	1
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	FJAW-80-0319	3/9/2019	WG	FD	15	25	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.41	µg/L	U	0.41	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.2	µg/L	U	0.2	0.2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.41	µg/L	U	0.41	0.41
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	0.12	µg/L	U	0.12	0.2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.41	µg/L	U	0.41	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	DNX	DNX	DNX	0.26	µg/L	U	0.26	0.51
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	HMX	2691-41-0	HMX	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	MNX	5755-27-1	MNX	0.3	µg/L	U	0.3	0.51
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.2	µg/L	U	0.2	0.41
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	RDX	121-82-4	RDX	0.41	µg/L	U	0.41	0.41
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.2	µg/L	U	0.2	0.25
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Explosives	SW8330B	TNX	13980-04-6	TNX	0.26	µg/L	U	0.26	0.51
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Metals	SW6020	AS	7440-38-2	Arsenic	8	µg/L	U	8	10
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Metals	SW6020	BA	7440-39-3	Barium	230	µg/L	J	1.8	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	6.6	µg/L	J	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	0.64	µg/L	J	0.18	3
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	6	µg/L	J	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	35	µg/L	J	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	1.4	µg/L	J	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.29	µg/L	U	0.16	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	5.9	µg/L	J	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.75	µg/L	J	0.2	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	2.5	µg/L	J	0.4	1
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	JAW-80	JAW-80-0319	3/9/2019	WG	N	15	25	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	4	µg/L	J	0.4	3
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	0.8	µg/L	UJ	0.8	3
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	1.6	µg/L	UJ	1.6	5
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	0.4	µg/L	UJ	0.4	1

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	4	µg/L	UJ	4	5
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	ACE	67-64-1	Acetone	6.4	µg/L	UJ	6.4	10
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BZ	71-43-2	Benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	0.2	µg/L	UJ	0.2	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TBME	75-25-2	Bromoform	1	µg/L	UJ	1	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BRME	74-83-9	Bromomethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	0.8	µg/L	UJ	0.8	2
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	0.4	µg/L	UJ	0.4	2
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CLME	74-87-3	Chloro methane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	1.6	µg/L	UJ	1.6	2
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TCLME	67-66-3	Chloroform	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	0.8	µg/L	UJ	0.8	2
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	4	µg/L	UJ	4	6
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	3.2	µg/L	UJ	3.2	5
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	0.8	µg/L	UJ	0.8	5
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	2	µg/L	UJ	2	5
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	STY	100-42-5	Styrene	0.8	µg/L	UJ	0.8	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	BZME	108-88-3	Toluene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	0.4	µg/L	UJ	0.4	1
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	0.8	µg/L	UJ	0.8	2
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	0.2	µg/L	UJ	0.2	1.5
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	0.8	µg/L	UJ	0.8	2
Fire Training Pit	M-01	M-01-0319	3/24/2019	WG	N	8	18	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	0.4	µg/L	UJ	0.4	1
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	TNB135	99-35-4	1,3,5-Trinitrobenzene	0.39	µg/L	U	0.39	0.96
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	DNB13	99-65-0	1,3-Dinitrobenzene	0.19	µg/L	U	0.19	0.39
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	TNT	118-96-7	2,4,6-Trinitrotoluene	0.39	µg/L	U	0.39	0.39
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	DNT24	121-14-2	2,4-Dinitrotoluene	0.19	µg/L	U	0.19	0.39
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	DNT26	606-20-2	2,6-Dinitrotoluene	0.19	µg/L	U	0.19	0.19
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	A2DNT46	35572-78-2	2-Amino-4,6-dinitrotoluene	1.2	µg/L	J	0.12	0.19
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	NBZME2	88-72-2	2-Nitrotoluene	0.19	µg/L	U	0.19	0.39
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	NBZME3	99-08-1	3-Nitrotoluene	0.39	µg/L	U	0.39	0.39
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	A4DNT26	19406-51-0	4-Amino-2,6-dinitrotoluene	4.4	µg/L	J	0.12	0.19
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	NBZME4	99-99-0	4-Nitrotoluene	0.39	µg/L	U	0.39	0.96
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	DNX	DNX	DNX	0.24	µg/L	U	0.24	0.48
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	HMX	2691-41-0	HMX	0.19	µg/L	U	0.19	0.39
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	MNX	5755-27-1	MNX	0.28	µg/L	U	0.28	0.48
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	NO2BZ	98-95-3	Nitrobenzene	0.19	µg/L	U	0.19	0.39
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	RDX	121-82-4	RDX	5.1	µg/L	J	0.39	0.39
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	TETRYL	479-45-8	Tetryl	0.19	µg/L	U	0.19	0.23
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Explosives	SW8330B	TNX	13980-04-6	TNX	0.24	µg/L	U	0.24	0.48
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Metals	SW6020	AS	7440-38-2	Arsenic	56	µg/L		8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Metals	SW6020	BA	7440-39-3	Barium	510	µg/L		1.8	2

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Metals	SW6020	CD	7440-43-9	Cadmium	0.4	µg/L	U	0.4	0.5
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Metals	SW6020	CR	7440-47-3	Chromium	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Metals	SW6020	PB	7439-92-1	Lead	2	µg/L	U	2	3
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Metals	SW6020	SE	7782-49-2	Selenium	4	µg/L	U	4	5
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Metals	SW6020	AG	7440-22-4	Silver	1.8	µg/L	U	1.8	2
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	Metals	SW7470A	HG	7439-97-6	Mercury	0.15	µg/L	U	0.15	0.2
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	PAHs	SW8260B	NAPH	91-20-3	Naphthalene	10	µg/L		8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	SVOCs	SW8260B	TCB124	120-82-1	1,2,4-Trichlorobenzene	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	SVOCs	SW8260B	DCBZ12	95-50-1	1,2-Dichlorobenzene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	SVOCs	SW8260B	DCBZ13	541-73-1	1,3-Dichlorobenzene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	SVOCs	SW8260B	DCBZ14	106-46-7	1,4-Dichlorobenzene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	SVOCs	SW8260B	HCBU	87-68-3	Hexachlorobutadiene	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TC1112	630-20-6	1,1,1,2-Tetrachloroethane	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TCA111	71-55-6	1,1,1-Trichloroethane	9.7	µg/L	J	1.6	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	PCA	79-34-5	1,1,2,2-Tetrachloroethane	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TCA112	79-00-5	1,1,2-Trichloroethane	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	FC113	76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	5.1	µg/L	J	1.8	30
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCA11	75-34-3	1,1-Dichloroethane	200	µg/L		8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCE11	75-35-4	1,1-Dichloroethene	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCP11	563-58-6	1,1-Dichloropropene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TCB123	87-61-6	1,2,3-Trichlorobenzene	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TCPR123	96-18-4	1,2,3-Trichloropropane	8	µg/L	U	8	30
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TMB124	95-63-6	1,2,4-Trimethylbenzene	63	µg/L		4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DBCP	96-12-8	1,2-Dibromo-3-chloropropane	16	µg/L	U	16	50
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	EDB	106-93-4	1,2-Dibromoethane	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCA12	107-06-2	1,2-Dichloroethane	9.9	µg/L	J	1.3	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCPA12	78-87-5	1,2-Dichloropropane	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TMB135	108-67-8	1,3,5-Trimethylbenzene	16	µg/L		4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCPA13	142-28-9	1,3-Dichloropropane	2	µg/L	U	2	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CLHX1	544-10-5	1-Chlorohexane	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCPA22	594-20-7	2,2-Dichloropropane	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CLBZME2	95-49-8	2-Chlorotoluene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	HXO2	591-78-6	2-Hexanone	40	µg/L	U	40	50
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CYMP	99-87-6	4-Isopropyltoluene	3.4	µg/L	J	2	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	ACE	67-64-1	Acetone	200	µg/L		64	100
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BZ	71-43-2	Benzene	82	µg/L		4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BRBZ	108-86-1	Bromobenzene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BRCLME	74-97-5	Bromochloromethane	2	µg/L	U	2	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BDCME	75-27-4	Bromodichloromethane	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TBME	75-25-2	Bromoform	10	µg/L	U	10	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BRME	74-83-9	Bromomethane	8	µg/L	U	8	20
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CDS	75-15-0	Carbon disulfide	8	µg/L	U	8	20
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CTCL	56-23-5	Carbon tetrachloride	4	µg/L	U	4	20
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CLME	74-87-3	Chloro methane	8	µg/L	U	8	20
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CLBZ	108-90-7	Chlorobenzene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CLEA	75-00-3	Chloroethane	690	µg/L		16	20
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TCLME	67-66-3	Chloroform	1.9	µg/L	U	1.6	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCE12C	156-59-2	cis-1,2-Dichloroethene	3	µg/L	J	1.5	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCP13C	10061-01-5	cis-1,3-Dichloropropene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DBCME	124-48-1	Dibromochloromethane	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DBMA	74-95-3	Dibromomethane	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	FC12	75-71-8	Dichlorodifluoromethane	8	µg/L	U	8	20
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	EBZ	100-41-4	Ethyl- benzene	66	µg/L		4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	IPBZ	98-82-8	Isopropylbenzene	3.9	µg/L	J	1.9	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	MEK	78-93-3	Methyl ethyl ketone	44	µg/L	J	20	60
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	MIBK	108-10-1	Methyl isobutyl ketone	110	µg/L		32	50
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TBUTMEE	1634-04-4	Methyl tert-butyl ether (MTBE)	8	µg/L	U	8	50
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	MTLNCL	75-09-2	Methylene chloride	59	µg/L		20	50
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BTBZN	104-51-8	N-Butylbenzene	1.7	µg/L	J	1.4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	PBZN	103-65-1	N-Propylbenzene	5.7	µg/L	J	1.6	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	CLBZME4	106-43-4	p-Chlorotoluene	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BTBZS	135-98-8	sec-Butylbenzene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	STY	100-42-5	Styrene	8	µg/L	U	8	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BTBZT	98-06-6	tert-Butylbenzene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	PCE	127-18-4	Tetrachloroethene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	BZME	108-88-3	Toluene	1400	µg/L		4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCE12T	156-60-5	trans-1,2-Dichloroethene	4	µg/L	U	4	10

Appendix G

Complete 2018-2020 Groundwater Analytical Results: Fire Training Pit

Iowa Army Ammunition Plant, Middletown, Iowa

Site Name	Location Name	Sample Name	Sample Date	Sample Matrix	Sample Type Code	Sample Beginning Depth	Sample Ending Depth	Analytical Group	Analytical Method	Analyte ERPIMS Parlabel	CAS Number	Analyte	Result Value	Result Units	Result Flag	Method Detection Limit	Reporting Limit
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	DCP13T	10061-02-6	trans-1,3-Dichloropropene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	TCE	79-01-6	Trichloroethene	4	µg/L	U	4	10
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	FC11	75-69-4	Trichlorofluoromethane (Freon 11)	8	µg/L	U	8	20
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	VC	75-01-4	Vinyl chloride	2	µg/L	U	2	15
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	XYLMP	XYLMP	Xylene, m,p-	270	µg/L		8	20
Fire Training Pit	SA-99-1	SA-99-1-0319	3/21/2019	WG	N	18	23	VOCs	SW8260B	XYLO	95-47-6	Xylene, o-	86	µg/L		4	10