

FINAL

Explanation of Significant Differences
for the Records of Decision Soils
Operable Unit 1 (OU-1) Addition of
Land Use Controls, Off-site Disposal of
Contaminated Soil, and the Fire
Training Pit for Iowa Army
Ammunition Plant, Middletown, Iowa
Contract No. W912QR-12-D-0005,
Delivery Order 0006

Prepared for

U.S. Army Corps of Engineers
Louisville District

600 Dr. Martin Luther King Jr. Place
Louisville, Kentucky 40202-2232



October 2018


STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Environmental Services at Iowa Army Ammunition Plant Middletown, Iowa

U.S. ARMY CORPS OF ENGINEERS LOUISVILLE DISTRICT

The CH2M team has completed the Draft submittal of the **Explanation of Significant Differences for the Records of Decision Soils Operable Unit 1 (OU-1) Addition of Land Use Controls, Off-site Disposal of Contaminated Soil, and the Fire Training Pit for Iowa Army Ammunition Plant, Middletown, Iowa**. Notice is hereby given that an independent technical review (ITR) has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Project Management Plan and Contractor Quality Control Plan. During the ITR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures and material used in analyses; the appropriateness of data used and level of data obtained; and reasonableness of the results including whether the product meets the USACE's needs consistent with the law and existing USACE policy.

Leidos Project Manager



09/28/2018

Signature

Date

Matthew Vest

Leidos ITR Team Leader



09/28/2018

Signature

Date

Matthew Bange

FINAL

**EXPLANATION OF SIGNIFICANT DIFFERENCES
FOR THE RECORDS OF DECISION SOILS
OPERABLE UNIT 1 (OU-1)**

**ADDITION OF LAND USE CONTROLS, OFF-SITE
DISPOSAL OF CONTAMINATED SOIL, AND
THE FIRE TRAINING PIT
FOR
IOWA ARMY AMMUNITION PLANT
MIDDLETOWN, IOWA**

**Prepared By:
Leidos
13397 Lakefront Drive, Suite 100
Earth City, MO 63045**

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LIST OF ACRONYMS AND ABBREVIATIONS

AEC	Atomic Energy Commission
AO	American Ordnance
Army	U.S. Army
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	contaminant of concern
CY	cubic yard(s)
DCE	dichloroethene
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
ESD	Explanation of Significant Differences
FFA	Federal Facilities Agreement
FUSRAP	Formerly Utilized Sites Remedial Action Program
HMX	high melt explosive
IAAAP	Iowa Army Ammunition Plant
IDA	Inert Disposal Area
IROD	Interim Action Record of Decision
LAP	load, assemble, and pack
LDR	land disposal restriction
LTTD	low temperature thermal desorption
LUC	land use control
LUCIP	Land Use Controls Implementation Plan
LUCRD	Land Use Controls Remedial Design
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OU	operable unit
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PCP	pentachlorophenol
PFAS	per- and poly-fluoroalkyl substances
RDX	royal demolition explosive
RG	remediation goal
RI	remedial investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
S/S	solidification/stabilization
SVOC	semi-volatile organic compound
TCE	trichloroethylene
TNT	trinitrotoluene
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
UU/UE	unlimited use and unrestricted exposure
VOC	volatile organic compound

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1.0 INTRODUCTION AND STATEMENT OF PURPOSE

This Explanation of Significant Differences (ESD) presents the rationale for modifications to the selected remedy identified in the Interim Action Record of Decision (Irod) for the Soils Operable Unit (OU) 1, dated March 1998, and the Final Record of Decision (ROD) for the Soils Operable Unit (OU-1), dated September 1998, at the Iowa Army Ammunition Plant (IAAAP) in Middletown, Iowa (U.S. Environmental Protection Agency [USEPA] ID: IA7213820445).

Except as noted herein, the U.S. Army (Army) serves as the lead agency for executing the remedy selected in the Irod and Final ROD (collectively referred to herein as the “IAAAP Soils RODs”) with support from the USEPA as the lead regulatory agency and ensures that cleanup activities conducted by the Army meet the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and the IAAAP Federal Facilities Agreement (FFA).

Particular areas of concern at the IAAAP are being addressed by the U.S. Army Corps of Engineers (USACE) under the Formerly Utilized Sites Remedial Action Program (FUSRAP). These areas are identified in the FFA executed between the USEPA, USACE, U.S. Department of Energy (DOE), and the State of Iowa (Administrative Docket Number: CERCLA-07-2005-0378 (FUSRAP FFA)). The scope as defined in the FUSRAP FFA covers response actions at seven areas associated with historic Atomic Energy Commission (AEC) activity, including Line 1 and the West Burn Pads Area (South of the Road). The USACE is the lead agency for implementing environmental restoration activities in areas within the scope of the FUSRAP FFA. To the extent the remedy selected in the IAAAP Soils RODs is appropriate for areas identified for FUSRAP response; the USACE is implementing the selected remedy. FUSRAP response actions at Line 1 and the West Burn Pads Area (South of the Road) are being executed pursuant to the IAAAP Soils RODs. The remaining FUSRAP areas are being addressed under separate CERCLA actions and are outside the scope of this document.

This ESD was prepared in accordance with Section 117(c) & (d) of CERCLA, 42 U.S.C. 9601 *et seq.*, as amended by SARA, and Sections 300.435(c)(2)(i) and 300.825(a)(2) of the NCP. The NCP requires the publication of an ESD when modifications to the remedial action selected in a ROD are necessary, and such modifications significantly change, but do not fundamentally alter, the remedial action with respect to the scope, performance, or cost.

The purpose of this ESD is to provide information to support modifications to portions of the selected remedy described in the IAAAP Soils RODs. The three specific changes to the selected remedy, presented in greater detail herein, include the following:

1. Establish land use controls (LUCs) as the long-term component necessary to provide overall protectiveness of human health and the environment for soil at OU-1 areas at the IAAAP.
2. Allow off-site treatment and disposal for any remaining contaminated soil that may require removal at OU-1 areas.
3. Add the Fire Training Pit (IAAP-039) to OU-1.

The ESD summarizes information that led to the making of the changes to the remedy, affirms that the remedy will still comply with the statutory requirements of CERCLA § 121, and that the

proposed changes do not fundamentally alter the overall remedy for OU-1. A notice of availability and a brief description of this ESD will be published in the Hawk Eye Newspaper, Burlington, Iowa, to provide the public with an explanation of the Army's proposal to modify the selected remedy for the OU-1. This ESD will become part of the Administrative Record pursuant to Section 300.825(a)(2) of the NCP. The Administrative Record for IAAAP is available online at the following address: www.iaaprestoration.com.

2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

The IAAAP is a government-owned, contractor-operated munitions production facility under the command of the U.S. Army Joint Munitions Command, Rock Island, Illinois. The current operating contractor is American Ordnance (AO). IAAAP occupies approximately 19,000 acres in the town of Middletown in Des Moines County, Iowa, and is bordered by U.S. Highway 34 to the north, upland agricultural farms to the east and west, and the Skunk River Valley to the south. Approximately one-third of the IAAAP property is occupied by active or formerly active production or storage facilities. The property includes production lines, former surface impoundments, landfills and disposal areas, burn pads, demolition areas, and fire training areas. The remaining land is either woodlands or property leased for agricultural use.

2.1 SITE HISTORY

The plant was built between 1941 and 1945 and was originally called the Iowa Ordnance Plant. Production of munitions at the IAAAP began in 1941. Production activities include loading, assembling, and packaging (LAP) of munitions, including projectiles, mortar rounds, warheads, demolition charges, anti-tank mines, and anti-personnel mines. The LAP operations use explosives-containing materials and lead-based initiating compounds. The historic AEC operated at some facilities at the IAAAP from 1947 to 1975 assembling components of nuclear weapons. Some areas of IAAAP are known to contain contamination (e.g., depleted uranium, explosives, and metals) resulting from AEC operations.

2.2 SOURCES OF CONTAMINATION

Past munitions production has resulted in contamination of soil and groundwater and discharge of wastewater containing explosives and explosives by-products to surface water. The primary source of contamination is attributable to past operating practices in which explosives-contaminated (2,4,6-trinitrotoluene [TNT], Royal Demolition Explosive [RDX], High Melt Explosive [HMX]) wastewaters and sludges were discharged to uncontrolled lagoons and impoundments at the IAAAP. Additional sources of contamination included open burning of explosives materials and munitions and landfilling of waste material. Metals, semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs) were also identified as contaminants of concern (COCs) at certain OU-1 areas.

2.3 REGULATORY OVERVIEW

The USEPA added the IAAAP to the National Priorities List in 1990. The U.S. Department of Defense (DoD) has established the Defense Environmental Restoration Program to address DoD sites under CERCLA, as amended by SARA. The USEPA and the Army signed the IAAAP FFA for site cleanup, which became effective December 10, 1990 (U.S. Army and USEPA 1990). The IAAAP FFA provides a framework for CERCLA response actions to be performed at the IAAAP, including the investigation and cleanup of contamination. Except as noted herein, the Army as an agency within the DoD, is the lead DoD agency for implementing environmental restoration activities at the IAAAP and executing the remedy selected in the IAAAP Soils RODs. The USEPA is the support agency (lead regulatory agency) and ensures that cleanup activities conducted by the Army meet the requirements of CERCLA, SARA, NCP, and the IAAAP FFA.

The State of Iowa is not currently a party to the FFA, however, site documents are sent to the State for review and concurrence and the State participates in the Restoration Advisory Board and public meetings for the IAAAP.

Several areas at the IAAAP are being addressed by the USACE under the FUSRAP. These areas are identified in the FFA executed between the USEPA, USACE, the DOE, and the State of Iowa (Administrative Docket Number: CERCLA-07-2005-0378) in 2006 (the “FUSRAP FFA”) (USEPA et al. 2006). The USACE is the lead agency for implementing environmental restoration activities in areas within the scope of the FUSRAP FFA. Two FUSRAP areas; Line 1 and the West Burn Pads Area (South of the Road), are being executed pursuant to the IAAAP Soils RODs. The remaining FUSRAP areas are being addressed under separate CERCLA actions and are outside the scope of this document. Additionally, groundwater is being evaluated in the site-wide groundwater operable unit (OU-6).

2.4 SELECTED REMEDY IN THE IAAAP SOILS RODS

Collectively, the IAAAP Soils RODs and five ESDs document the selected remedy to address the contaminated soils at OU-1 areas. The 15 areas addressed in the OU-1 IROD include:

1. Line 1
2. Line 2
3. Line 3
4. Line 3A
5. Lines 4A/4B
6. Lines 5A/5B
7. Line 6
8. Line 8
9. Line 9
10. Line 800
11. East Burn Pads Area
12. Demolition Area/Deactivation Furnace
13. Burn Cages/West Burn Pads Area (including West Burn Pads Area [South of the Road])
14. North Burn Pads Area (and Landfill), and
15. Roundhouse Transformer Storage Area

In 2008, the *Explanation of Significant Differences for the Interim Action Record of Decision (IROD) Soils Operable Unit 1 (OU-1) Addition of Environmental Protectiveness to the Remedy and Transfer of Sites from OU-4 to OU-1* (Tetra Tech 2008a) transferred three areas from the Installation-Wide OU (OU-4) to OU-1 to address chemically-contaminated soil consistent with the remediation strategy defined for the OU-1. The three areas are:

1. Incendiary Disposal Area
2. Possible Demolition Area
3. Central Test Area

The IROD (USAEC 1998) defined the remedy as excavation of soils containing chemical constituents at concentrations greater than remediation goals (RGs) based upon a human health risk evaluation. These include criteria associated with ingestion and dermal contact with contaminated soils by the reasonably maximum exposed individual under an industrial land use scenario, as well as criteria to evaluate possible leaching of contaminants from soils to

groundwater at unacceptable levels. The COCs defined for OU-1 soils included explosives (primarily RDX and 2,4,6-TNT), metals (lead), SVOCs, and PCBs (USAEC 1998). Excavated soils were segregated by contaminant type and concentration to facilitate treatment of principal threat wastes to permanently reduce contaminant toxicity, mobility and volume in accordance with CERCLA. Under the IROD, highly contaminated soils with a cumulative risk greater than $1E-5$ (primarily explosives-contaminated soil) or that exceeded land disposal restrictions (LDRs) were considered to represent the principal threat wastes and would require treatment prior to disposal. The remaining volume of contaminated soils did not require treatment prior to on-site disposal.

The major components of the remedial action as defined by the IROD were:

- Excavation of soils with COC concentrations exceeding RGs.
- Segregation of contaminated soils according to contaminant type and risk level.
- Temporary storage of the highly contaminated soil with risk levels above $1E-5$ or that fail LDR criteria in the on-site Inert Disposal Area (IDA) at Trench 7 pending treatment as defined in the Final ROD,
- Permanent disposal of soils with risk levels between $1E-5$ and $1E-6$ in the on-site Soil Repository (Trench 6),
- Permanent disposal of contaminated soils with risk levels below $1E-6$ and above the groundwater protection RGs in the on-site Soil Repository or the on-site Inert Landfill, and
- Solidification/stabilization (S/S) of metals-contaminated soils at levels exceeding LDR criteria, and permanent disposal in the on-site Soil Repository.

The Final ROD (USACE 1998) defined the treatment methods (prior to disposal) for the most highly contaminated soils which were temporarily being stored in Trench 7 as a result of the IROD. Separate treatment alternatives were developed for soils contaminated with explosives, soils contaminated with explosives and metals, and soils contaminated with SVOCs. The treatment processes for excavated soils as defined by the Final ROD were:

- On-site treatment of explosives-contaminated soils with risk levels above $1E-5$, or that fail LDR criteria using low temperature thermal desorption (LTTD) with biological treatment selected as the contingency treatment.
- On-site treatment of explosives-contaminated plus metal-contaminated soils exceeding the LDRs with S/S using activated carbon prior to disposal at the on-site Soil Repository.
- Shipment of SVOC-contaminated soil for off-site disposal as non-hazardous waste at a USEPA-approved, permitted commercial waste facility.

During implementation of the IAAAP Soils RODs, modifications to the selected remedy were documented in ESDs executed in 2003, 2006, 2008, 2009, and 2011.

In 2003, the *Explanation of Significant Differences for the Final Record of Decision (ROD) for the Soils Operable Unit (OU-1)* (USEPA 2003) included the following changes to the Final ROD:

- Biological treatment of explosives-only contaminated soils became the preferred remedy due to safety and performance considerations resulting from the LTTD treatment process.

- Treatment of metals-only contaminated soil by S/S became necessary based on the volume of barium-contaminated soil found at the West Burn Pads Area.
- The revised remedy for soil contaminated with explosives-plus-metals incorporates a two-step process of biological treatment of explosives and S/S treatment of metals.

In 2006, the *Explanation of Significant Differences Deletion of Radiological Contaminants from the Interim Record of Decision* (Tetra Tech 2006) required:

- The removal of the soil RGs for radionuclides Actinium-228, Bismuth-214, and Potassium-40.

In 2008, the *Explanation of Significant Differences for the Interim Action Record of Decision (IROD) Soils Operable Unit 1 (OU-1) Addition of Environmental Protectiveness to the Remedy and Transfer of Sites from OU-4 to OU-1* (Tetra Tech 2008a) required:

- Potential ecological risks from contaminated soil at the IAAAP be assessed and if necessary, remedial actions taken to abate unacceptable ecological risks.

Ecological risks from contaminated soil were evaluated in the *Baseline Ecological Risk Assessment, Iowa Army Ammunition Plant, Iowa*, for the Indiana Bat which was targeted for individual protection because of its endangered status (MWH 2004). The ecological evaluation was used to identify additional contaminated soil (i.e., soil in addition to the soil that was excavated to address human health risks) that had been determined to pose an unacceptable ecological risk to the Indiana Bat. Any soil that required additional remediation was excavated and disposed of in accordance with the IAAAP Soils RODs.

In 2009, the *Explanation of Significant Differences for the Final Record of Decision (ROD) Soils Operable Unit 1 (OU-1) Change of Primary Treatment Technology* (Tetra Tech 2009) required:

- Further changing the treatment of explosives-contaminated soils to alkaline hydrolysis as it provides a more effective treatment, and
- Further changing the treatment of explosives and metals-contaminated soil to alkaline hydrolysis followed by solidification/stabilization.

In 2011, the *Explanation of Significant Differences for the Records of Decision, Soils Operable Unit 1 (OU-1), Addition of Soil Volume, Site Specific Remedial Goal for Barium, and Offsite Disposal of Contaminated soil for Iowa Army Ammunition Plant, Middletown, Iowa* (Tetra Tech 2011) defined three modifications:

- Derivation of a site-specific remedial goal for barium at the West Burn Pads Area (South of the Road),
- Increased volume of contaminated soil excavated from the West Burn Pads Area (South of the Road), and
- Change from on-site treatment and disposal to off-site treatment and disposal for contaminated soil excavated at Line 1 and West Burn Pads Area (South of the Road).

3.0 BASIS FOR THIS ESD

This ESD is documenting three separate, but related, additions to the selected remedy as stated in the IAAAP Soils RODs and ESDs. This ESD is limited in scope to response actions pursuant to the IAAAP Soil RODs. Each change will be discussed individually, as presented below.

3.1 LAND USE CONTROLS

In accordance with CERCLA, the baseline risk assessment presented in the *Remedial Investigation Report/Risk Assessment, Iowa Army Ammunition Plant, Middletown, Iowa*, provided an analysis of the potential adverse human health effects resulting from exposures to hazardous substances in soil based on the expected land use for the IAAAP (JAYCOR 1996). Using a commercial/industrial land use scenario, OU-1 soil RGs were developed for the protection of human health and were established at a target carcinogenic risk of 10^{-6} for all COCs in addition to more conservative values for RDX and 2,4,6-TNT (“leaching RGs”) for the protection of groundwater. Remediation of contaminated soil under OU-1 was completed to meet the RGs which are protective in the short-term (USACE 2016). The residual soil concentrations at the OU-1 areas in their current configuration do not pose an ecological risk.

In order for the remedy to be protective in the long term, LUCs are required to maintain protectiveness under a commercial/industrial land use scenario; prevent residential land use; and prohibit land use for elementary and secondary schools, childcare facilities, and playgrounds. No LUCs were defined as part of the IAAAP Soils RODs or ESDs, therefore, this ESD establishes the requirements for LUCs for OU-1 areas. These requirements also will pertain to the excavation areas associated with the non-time critical sumps removal actions prior to the IROD at the OU-1 areas (Appendix A). The LUCs will be required at the OU-1 areas of the IAAAP as identified in Figure 1. The LUCs necessary to ensure long-term protectiveness of the remedy will be specifically defined and described in a Land Use Controls Implementation Plan (LUCIP) to be developed after finalization of this ESD as part of the Land Use Controls Remedial Design (LUCRD).

The LUCs at OU-1 areas will include:

- Prohibitions on land use (e.g., through incorporation of a formal institutional control) to maintain commercial/industrial (i.e., non-residential), to prohibit residential land use, and to prohibit the development and use of the property for elementary and secondary schools, child care facilities and playgrounds;
- Access restrictions to prevent access to or use of contaminated soil until OU-1 RGs are met (e.g., authorized activities, dig permit requirements, utility repair);
- Installations of engineering controls (e.g., fencing, signs, cover material) may be required at some locations where contamination exceeds industrial RGs;
- Construction restrictions (i.e., personal protective equipment and proper waste disposal procedures for authorized intrusive activities) where contaminants exceed the industrial RGs; and
- Requirement for routine inspections to ensure LUCs remain in place and effective.

LUCs are already effectively in place through the current use of the facility as an Army Ammunition Plant with its associated security and property access restrictions. Additionally, LUCs that are currently in place regarding access and construction restrictions (e.g., dig permit requirements, utility repairs, maintenance work) will continue through internal coordination between the operating contractor and the IAAAP staff to ensure that workers are aware of and protected from potential environmental hazards, and that any contaminated soil is properly managed/disposed to prevent incidental exposures to human and ecological receptors. Hunting and fishing are allowed on the IAAAP only in designated areas and these restrictions are maintained through the *Iowa Army Ammunition Plant Regulation 420-1 Hunting and Fishing Regulation*. Additional engineering controls such as signage, fencing, or cover material may be established at inaccessible/residual soil areas to prevent access to contaminated soil if deemed necessary. These processes will be formally documented in the LUCIP.

Dig Permits will address management of soil under buildings at OU-1 areas that have not undergone sampling during past investigations. For each building planned for demolition at an OU-1 area, the potential for subsurface contamination will be evaluated based on the historic use of the building, proximity to remediated soil areas, and prior soil sampling results adjacent to the building. If the evaluation determines that subsurface soil contamination is likely, soil sampling within the building footprint will be conducted. If sample results show contamination exceeds the OU-1 RGs, then the soil will be remediated in accordance with the IAAAP Soils RODs and ESDs.

Routine inspections, as defined in the LUCIP, will be conducted to ensure that LUCs remain in-place and remain effective. LUCs will be evaluated as part of the five-year review process until additional remediation or investigation has been conducted that would indicate concentrations of COCs in the soil are at such levels to allow for unlimited use and unrestricted exposure (UU/UE) and only then may LUCs be discontinued. The Army will be responsible for implementing, maintaining, monitoring, enforcing, and reporting on the effectiveness of LUCs. Although the Army may later transfer some duties to other parties by contract or other means, the Army will retain ultimate responsibility for remedy integrity.

3.2 OFF-SITE TREATMENT AND DISPOSAL

In accordance with the IAAAP Soils RODs, contaminated soils at OU-1 areas were excavated to meet the RGs, treated as necessary, and disposed in the on-site Soils Repository, also known as the IDA (USAEC 1998 and USACE 1998). However, the IDA has met its maximum capacity and Trench 6, Trench 7, and the Cap Extension Area were closed between 2009 and 2011, in accordance with the requirements of the OU-4 IROD (Tetra Tech 2008b). Thus, the IDA is no longer available for treatment and disposal of any soils excavated at the IAAAP. Any future remedial actions necessary at IAAAP OU-1 areas that require excavation of soil to meet the RGs will require use of alternate treatment and disposal facilities.

Previously, on-site and off-site treatment and disposal options were evaluated as part of the *Explanation of Significant Differences for the Records of Decision, Soils Operable Unit 1 (OU-1), Addition of Soil Volume, Site Specific Remedial Goal for Barium, and Offsite Disposal of Contaminated soil for Iowa Army Ammunition Plant, Middletown, Iowa* (Tetra Tech 2011) for the two FUSRAP areas within OU-1, which are Line 1 and the West Burn Pads Area (South of the Road). As part of this evaluation, several factors were considered including the estimated volume of

soil requiring excavation, treatment, and disposal; the costs involved for off-site treatment and disposal; the amount of time and cost required to locate, design, and construct another on-site treatment and disposal facility; the limited construction season at IAAAP due to weather; the impact delay associated with establishing another on-site treatment and disposal facility would have on the remedial activities; and requirements for long-term maintenance of a new on-site facility. The 2011 ESD concluded that off-site treatment and disposal facilities were more efficient and cost effective than constructing new treatment and disposal facilities on-site at IAAAP.

The factors considered for the 2011 ESD remain applicable for potential disposal and treatment options for future OU-1 remedial actions. Additionally, future remedial actions are likely to be small-scale, sporadic excavations and the cost of maintaining on-site landfill operations over an extended period would be high as compared to off-site treatment and disposal. Based on these considerations, the use of EPA approved off-site treatment and disposal facilities is more efficient and cost effective than constructing new treatment and disposal facilities on-site at IAAAP.

3.3 ADDITION OF FIRE TRAINING PIT (IAAP-039) TO OU-1

The former Fire Training Pit is located south of Plant Road O, west of the Burn Pads Area, and north of the Explosive Waste Incinerator in the northeastern portion of the IAAAP. The Fire Training Pit soil had not been assigned to any OU. Adding this area to OU-1 would facilitate management of LUCs that are also required at the former Fire Training Pit to ensure protectiveness in the long term.

The Fire Training Pit was an unlined, open depression that measured approximately 40 × 16 × 2 feet. A crescent-shaped berm, approximately 3 feet high, was present around the northern and western boundary of the pit. The Fire Training Pit also included the Fire Fighters Smoke Training Vault. The open depression was used to train fire fighters; the training procedure was to soak dunnage lumber with waste solvents and set it ablaze. From 1982 through 1987, fifty-five gallon drums of solvents or fuels were placed in the vault, set ablaze, and extinguished by fire fighters. Waste solvents were used for this purpose from 1982 to 1984, and fuels were used from 1984 through 1987. Wastewater from fire extinguishing practices was directed to the Fire Training Pit.

During the Installation-wide remedial investigation (RI), soil contamination was identified at the former Fire Training Pit. In 1998/1999, soil contaminated with 1,1-dichloroethene (DCE); trichloroethylene (TCE); tetrachloroethene (PCE); benzene; pentachlorophenol (PCP); methylene chloride; and lead were excavated and treated under a non-time critical removal action under CERCLA in accordance with the *Engineering Evaluation/Cost Analysis Study, Iowa Army Ammunition Plant, Fire Training Pit* (HARZA 1996) and the *Fire Training Pit Explanation of Significant Difference and Action Memorandum, Iowa Army Ammunition Plant, Middletown, Iowa* (ECC 1997). Approximately 4,300 cubic yards (CY) of contaminated soil was excavated from the former Fire Training Pit and transported to the IDA for treatment and landfill disposal. Approximately 2,700 CY of excavated volatile organic compound (VOC) and SVOC-contaminated soils were treated via low temperature thermal desorption prior to disposal and the remainder was treated using a land-farming process. Lead-contaminated soil did not require treatment. All soil was disposed of in Trench 6 of the IDA.

Following the completion of the 1998/1999 removal action at the former Fire Training Pit, two additional areas of potential soil contamination were identified near the former Fire Training Pit as a result of an examination of historic aerial photographs and engineering drawings.

A supplemental excavation of approximately 620 CY was completed in 2004 in accordance with the *Supplemental Work Plan, Fire Training Pit Removal Action, Iowa Army Ammunition Plant, Middletown, Iowa*, (ECC 2003).

Upon completion of the three excavations, all the remaining soil in place above the water table met the Fire Training Pit specific RGs and the OU-1 RGs. LUCs, as specified in Section 3.1, are also required at the former Fire Training Pit to ensure protectiveness in the long term because the Fire Training Pit specific RGs were developed using a commercial/industrial land use scenario.

4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES

The following text summarizes the three changes to the selected remedy as documented in the OU-1 IAAAP Soils RODs.

4.1 LAND USE CONTROLS

For the OU-1 remedy to be protective in the long term, LUCs need to be fully implemented. No LUCs were defined as part of the IAAAP Soils RODs or ESDs, therefore, this ESD establishes the requirements for LUCs at all OU-1 areas to be protective of individuals who may be exposed to the soils at OU-1 areas under a commercial/industrial land use setting; prevent residential land use; and prohibit land use for elementary and secondary schools, childcare facilities, and playgrounds. The LUCs necessary to ensure long-term protectiveness of the soils remedy will be specifically defined and described in a LUCIP. The LUCIP shall contain implementation and maintenance actions, including periodic inspections, with restrictions stated in full or by reference within deeds, easements, covenants, mortgages, leases, or other instruments of property transfer, as appropriate, if the property to transferred to non-federal ownership.

4.2 OFF-SITE TREATMENT AND DISPOSAL

This ESD revises the remedy under the IAAAP Soils RODs to add off-site treatment and disposal for all remaining contaminated soil at the OU-1 areas that may be excavated in the future to meet the RGs for OU-1. The requirement for off-site treatment will depend on the type of contamination. Soil with contaminant concentration levels above $1E-5$ risk or above LDRs would be transported to a Class C landfill for off-site treatment and disposal. Soils with contaminant levels between $1E-5$ and $1E-6$ or meeting LDRs will not be treated prior to disposal and would be transported to a USEPA-approved off-site landfill.

4.3 ADDITION OF THE FIRE TRAINING PIT (IAAP-039) TO OU-1

The performance criteria are described in the IAAAP Soils RODs and ESDs for OU-1 and are not altered by this ESD. Based on the current data for the former Fire Training Pit, no additional soil remediation is required. Potential impacts associated with the use of fire-fighting foam (per- and poly-fluoroalkyl substances [PFAS]) at the IAAAP are currently under evaluation. Any actions required to address the release of PFAS, if warranted, will be addressed under a separate decision document.

Adding this area to OU-1 would facilitate management of LUCs required at the Fire Training Pit to ensure protectiveness in the long term.

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5.0 STATUTORY DETERMINATIONS

The addition of LUCs, the addition of off-site treatment and disposal of remediated soil, and the addition of the Fire Training Pit as part of OU-1 do not change the scope of the remedy or adversely affect the ability of the remedy to comply with the statutory requirements of CERCLA §121, as required by the NCP §300.430(f)(5)(ii). Specifically, the remedy:

- remains protective of human health and the environment;
- complies with federal and state requirements that were identified as applicable or relevant and appropriate requirements at the time the OU-1 IAAAP Soils RODs were signed; and
- utilizes permanent solutions or alternate treatment technologies to the maximum extent practicable.

Further, as provided in the IAAAP Soils RODs, reviews will be conducted every five years to ensure that the remedy continues to provide adequate protection of human health and the environment. The next Five-Year Review for OU-1 is scheduled to be completed by the Army in March 2021. Two OU-1 areas (Line 1 and the West Burn Pads South of the Road) will be evaluated in the first Five-Year Review for FUSRAP conducted by the USACE which is scheduled for completion in 2018.

In summary, the revised remedy satisfies the statutory requirements of Section 121 of CERCLA.

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6.0 PUBLIC PARTICIPATION

In accordance with the requirements of Section 300.435(c)(2)(i) of the NCP, a notice of availability and a brief description of the ESD will be placed in the Burlington Hawk Eye newspaper. This ESD will also be made available to the public by placing it in the Administrative Record file. The electronic Administrative Record is available at www.iaaprestoration.com.

The points of contact for public inquiries are:

Danny O'Connor
USEPA – Region VII
11201 Renner Blvd
Lexana, KS 66219
913-551-7868

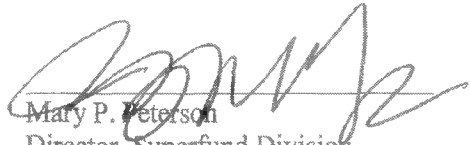
Jennifer Busard
JMIA-OSR
Iowa Army Ammunition Plant
17571 DMC Highway 79
Middletown, IA 52638-5000
319-753-7339

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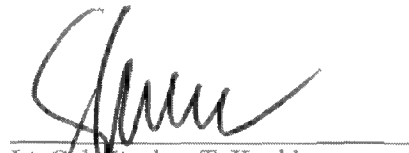
7.0 DECLARATION

For the foregoing reasons, by my signature below, the USEPA is issuing this ESD to the IAAAP Soils RODs for the OU-1 at the IAAAP in Middletown, Iowa.

10-22-18
Date


Mary P. Peterson
Director, Superfund Division
U.S. Environmental Protection Agency
Region VII

October 2018
Date


Lt. Col. Stephen T. Koehler
Commander
Iowa Army Ammunition Plant

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8.0 REFERENCES

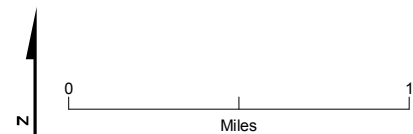
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- Tetra Tech 2008b. *Interim Action Record of Decision for Trench 6, Trench 7, and the Cap Extension Area of the Inert Disposal Area (IDA) in Soils Operable Unit 4 (OU-4) Iowa Army Ammunition Plant, Middletown, IA, Draft Final, Rev. 1. September.*
- Tetra Tech 2009. *Explanation of Significant Differences for the Final Record of Decision (ROD) Soils Operable Unit 1 (OU-1) Change of Primary Treatment Technology From Biological to Alkaline Hydrolysis Chemical Treatment for Iowa Army Ammunition Plant, Middletown, IA, Final, September.*
- Tetra Tech 2011. *Explanation of Significant Differences for the Final Record of Decisions (ROD) Soils Operable Unit (OU-1) Addition of Soil Volume, Site-Specific Remedial Goal for Barium, and Offsite Disposal of Contaminated Soil for Iowa Army Ammunition Plant, Middletown, Iowa, Final, March.*
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USEPA et al. 2006. *Iowa Army Ammunition Plant Federal Facility Agreement Under CERCLA Section 120*, Administrative Docket Number: CERCLA-07-2005-0378, U.S. Environmental Protection Agency, Region 7, State of Iowa, and the U.S. Army Corps of Engineers.



FIGURE 1
OU-1 Areas
 Iowa Army Ammunition Plant
 Middletown, Iowa



APPENDIX A
NON-TIME CRITICAL REMOVAL ACTIONS PRIOR TO IROD

NON-TIME CRITICAL REMOVAL ACTIONS PRIOR TO IROD

Site ID	Site	Excavation ID ^a	Closest Building/ Structure	Area of Excavation (square feet)
IAAP-001	Line 1	1-40	North side of Building 1-40	280
IAAP-001	Line 1	1-08-1	Adjacent to West Side of Building 1-08-1	54
IAAP-001	Line 1	1-12	near Building 1-12	19,625
IAAP-001	Line 1	1-05-1N	near Building 1-05-1	4
IAAP-001	Line 1	1-05-1NE	near Building 1-05-1	4
IAAP-001	Line 1	1-05-1S	near Building 1-05-1	4
IAAP-001	Line 1	1-05-1SE	near Building 1-05-1	4
IAAP-001	Line 1	1-05-1U	near Building 1-05-1	49
IAAP-001	Line 1	1-05-2U	near Building 1-05-2	49
IAAP-001	Line 1	1-50N	Building 1-50 along the North Side	54
IAAP-001	Line 1	1-50S	Building 1-50 approximately 20 ft east of N/S runway	54
IAAP-002	Line 2	2-06-1	South side of Building 2-06-1 within shed 2-140-6	54
IAAP-002	Line 2	2-05-1NM	near Building 2-05-1	81
IAAP-002	Line 2	2-05-1S	near Building 2-05-1	81
IAAP-002	Line 2	2-05-1U	Located under the east side of Building 2-05-1	49
IAAP-002	Line 2	2-05-1W	Located on west side Building 2-05-1	18
IAAP-002	Line 2	2-05-2U	Located on east side of Building 2-05-2	49
IAAP-002	Line 2	2-50S	South side of Building 2-50 in shed 2-140-5	54
IAAP-002	Line 2	West Tank	West Recirculation Tank	220
IAAP-003	Line 3	3-01-1U	Under West Wall of Building 3-05-01	28
IAAP-003	Line 3	3-05-1N	North Side of Building 3-05-01	54
IAAP-003	Line 3	3-50S	near Building 3-50	49
IAAP-006	Line 5A/5B	5A-140-1	South of Building 5A-140-1	20
IAAP-006	Line 5A/5B	5A-140-2	South of Building 5A-140-2	20
IAAP-006	Line 5A/5B	5A-21	South side of Building 5A-21	4
IAAP-006	Line 5A/5B	5A-25	North side of Building 5A-25	4
IAAP-006	Line 5A/5B	5A-56	Near Building 5A-56	4
IAAP-006	Line 5A/5B	5A-28N	North of Building 5A-28	48
IAAP-006	Line 5A/5B	5A-28SE	Building 5A-28	48
IAAP-006	Line 5A/5B	5A-28SW	Building 5A-28	48
IAAP-006	Line 5A/5B	5B-140-1	South of Building 5B-140	20
IAAP-006	Line 5A/5B	5B-140-2	South of Building 5B-140	20
IAAP-006	Line 5A/5B	5B-140-3E	East of Building 5B-140	40
IAAP-006	Line 5A/5B	5B-140-3W	West of Building 5B-140	40
IAAP-006	Line 5A/5B	5B-21	East side of Building 5B-21	4
IAAP-006	Line 5A/5B	5B-25	West Side of Building 5B-25	4
IAAP-006	Line 5A/5B	5B-27	West Side of Building 5B-26	4
IAAP-006	Line 5A/5B	5B-55N	Northwest corner of Building 5B-55	4
IAAP-006	Line 5A/5B	5B-55S	Southwest corner of Building 5B-55	4
IAAP-006	Line 5A/5B	5B-56	North side of Building 5B-56	4
IAAP-007	Line 6	6-98	East side of Building 6-98	4

NON-TIME CRITICAL REMOVAL ACTIONS PRIOR TO IROD

Site ID	Site	Excavation ID ^a	Closest Building/ Structure	Area of Excavation (square feet)
IAAP-007	Line 6	6-19	At Building 6-19	4
IAAP-007	Line 6	600-86-2	South of Building 600-86-2	20
IAAP-010	Line 9	9-14A	East of Building 9-14	20
IAAP-010	Line 9	9-14B	East of Building 9-14	20
IAAP-010	Line 9	9-57	East of Building 9-57	20
IAAP-010	Line 9	9-58A	East of Building 9-58	20
IAAP-010	Line 9	9-58B	East of Building 9-58	20
IAAP-039	Fire Training Pit	Phase I Excavation ^b	Former training pit area	2500
IAAP-039	Fire Training Pit	Phase II Excavation ^b	Former training pit area	300
IAAP-039	Fire Training Pit	Phase III Excavation ^b	Former training pit area	Below previous excavations

^a Action Memorandum for the Explosive-Contaminated Sump Removal at the Iowa Army Ammunition Plant (CDM 1995). Sumps excavated in 1995.

^b Final Remedial Action Report, Iowa Army Ammunition Plant, Fire Training Pit. ECC 2000. Excavated in 1998.