

# **TOOELE ARMY DEPOT**

## **Tooele, Utah**

**Final**  
**Explanation of Significant Differences**  
**for the Record of Decision,**  
**Operable Unit 8, SWMU 6**  
**Tooele Army Depot,**  
**Tooele, Utah**

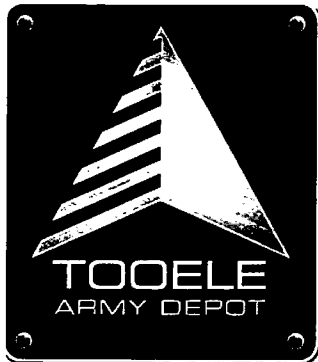


*Submitted to:*  
**Tooele Army Depot, and**  
**Army Environmental Command**

**March, 2010**



*Prepared by:*  
**PARSONS**  
**Salt Lake City, Utah**



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Remediation



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## 1.0 INTRODUCTION

This Explanation of Significant Difference (ESD) applies to the remedial actions performed under the Final Record of Decision (ROD) for Operable Unit (OU) 8; the Tooele Army Depot signed this ROD in January of 2004 (URS, 2004).

This ESD is being prepared in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and section 300.435(c)(2)(i) of the National Contingency Plan (NCP). The lead agency for this site is the U.S. Army and the regulatory agencies are the United States Environmental Protection Agency (USEPA) and the Utah Department of Environmental Quality (UDEQ). This ESD documents a significant change to a portion of the remedy selected in the ROD for the Tooele Army Depot. The remedy change is provided below.

- Due to uncertainty associated with the effectiveness and permanence of stabilization of leachable lead in debris from this site, and implementability concerns associated with hazards inherent in handling and applying the large volumes of phosphoric acid that would be needed for treatment, the Army has developed a revised remedial action approach assuming off-site disposal of soil and debris in an appropriately permitted TSDF.

This ESD will become part of the Tooele Army Depot administrative record as per NCP 300.825(a)(2)). The Tooele Army Depot Administrative Record which includes the ROD is available to the public at the following locations:

### Marriot Library

295 South 1500 East  
SLC, UT 84112-0860

*Hours: Monday through Thursday 7:00 a.m. to 12:00 p.m.*

*Friday, 7:00 a.m. to 6:00 p.m.*

*Saturday, 9:00 a.m. to 6:00 p.m.*

*Sunday, 12:00 p.m. to 12:00 p.m.*

### Tooele City Library

128 West Vine Street  
Tooele, UT 84074-2059

*Hours: Tuesday through Friday 10:00 a.m. to 8:00 p.m.*

*Saturday, 10:30 a.m. to 6:00 p.m.*

## 2.0 SITE HISTORY, CONTAMINATION AND SELECTED REMEDY

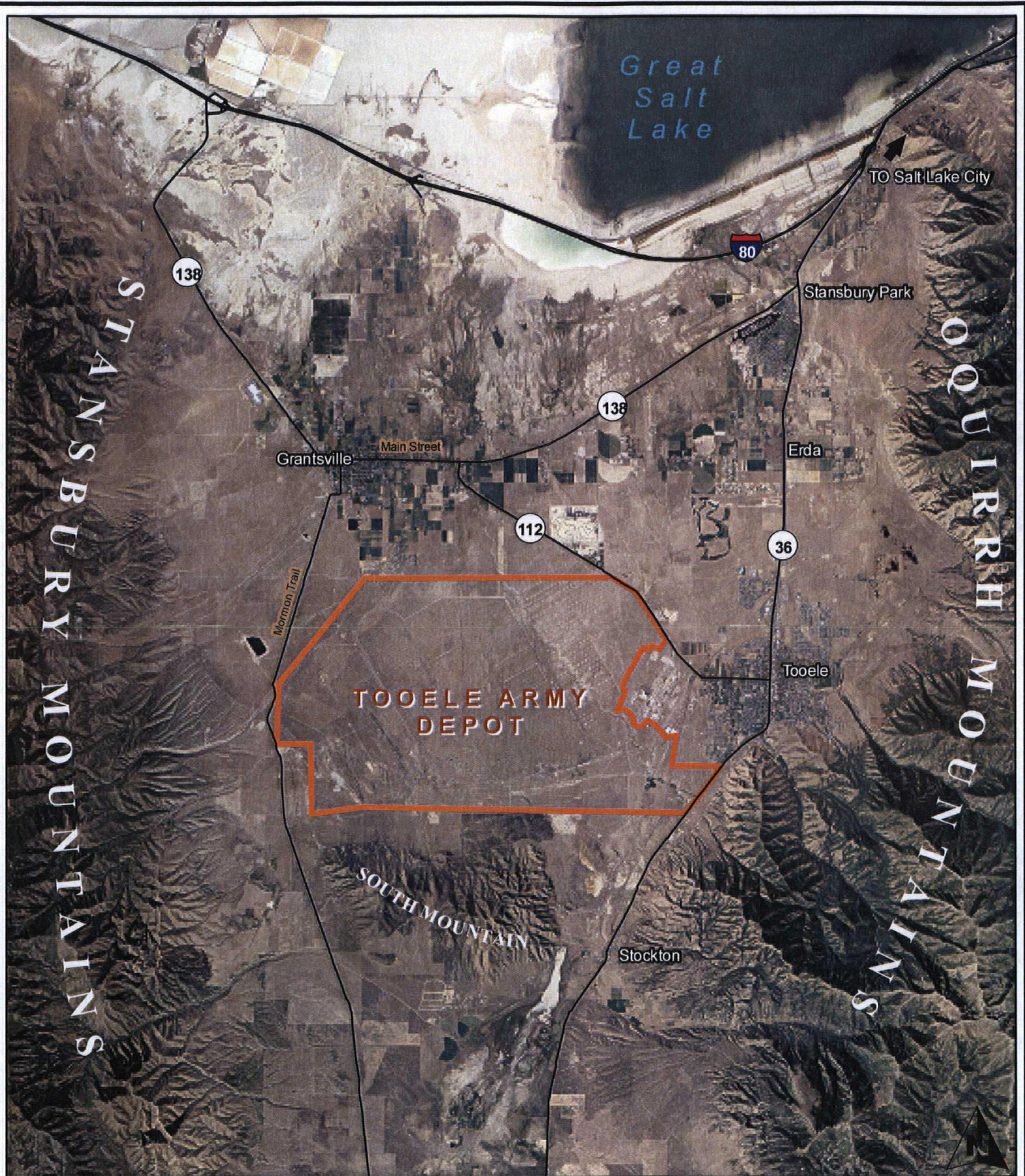
### 2.1 Site History

The Tooele Army Depot (TEAD), located in Tooele County, Utah, occupies approximately 23,914 acres (Figure 1.1). It was originally known as the Tooele Ordnance Depot and was established in 1942. The present mission at TEAD is to provide for the receipt, storage, issue, maintenance, and demilitarization of conventional training and war reserve ammunition, along with the design, manufacture, and fielding of ammunition peculiar equipment for all of the Department of Defense (DoD).

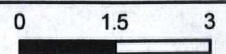
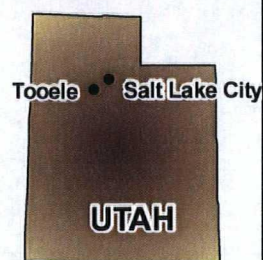
TEAD was included in the U.S. Army's Installation Restoration Program (IRP) in 1978. The initial Installation Assessment (USATHAMA, 1979) identified a number of known or suspected waste and spill sites and recommended further investigations. In 1984, TEAD was nominated for inclusion on the National Priorities List (NPL) because of the identified hazardous substances at some of the sites, primarily groundwater contamination at the Industrial Waste Lagoon, Solid Waste Management Unit (SWMU) 2. However, TEAD was not placed on the NPL until October 1990. In the interim, the U.S. District Court for the State of Utah issued a consent decree to TEAD for the groundwater contamination at SWMU 2. As part of being placed on the NPL, Federal Facilities Agreement (FFA) between the U.S. Army, EPA Region 8, and UDEQ designated 17 of 58 SWMUs to be investigated under CERCLA. These 17 SWMUs were grouped into Operable Units (OUs) 4 through 10. OU 8 contains five SWMUs, including SWMU 6.

Also in January 1991, TEAD was issued a Resource Conservation and Recovery Act (RCRA) Post Closure Permit for the SWMU 2 Industrial Waste Lagoon, which included a Corrective Action Permit (CAP) that required action at 29 SWMUs. Since that time several more SWMUs have been added to the RCRA CAP, which is regulated by the UDEQ. A number of environmental investigations have been performed and are ongoing under CERCLA or RCRA.

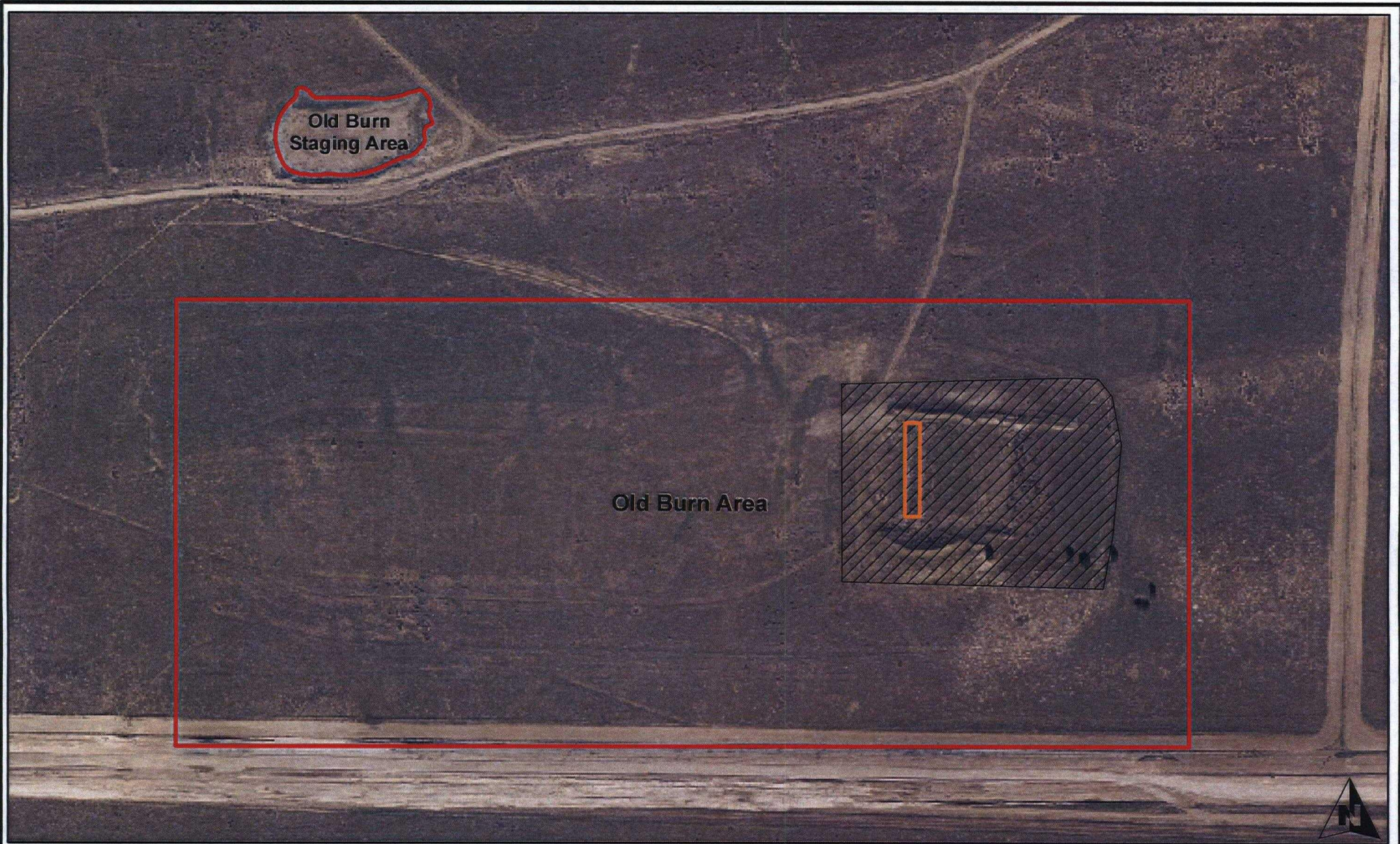
The SWMU 6 Old Bum Area consists of a gently sloping, grassy area with bermed revetment in the northeastern portion of the SWMU. Four natural surface drainages run off the north side of SWMU 6, where they are intercepted by a manmade drainage ditch. The approximate area of SWMU 6 is 70.1 acres (Figure 1.2). The SWMU 6 Old Bum Area was used for testing munitions, and for burning boxes and wooden crates on the ground surface and in shallow trenches. These activities were discontinued in the 1970s. One primary trench area, herein designated as the Former Bum Trench, has been delineated through test pit excavations (URS, 2004). Although the trench still contains metal debris and spent or destroyed munitions, it was subsequently backfilled with soil and re-graded. Although not found in previous investigations, MEC may be present in the Former Bum Trench.



**FIGURE 1.1 - TOOELE ARMY DEPOT LOCATION MAP**



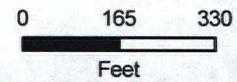
<b>PARSONS</b>	
Date:	10/07/2009
Designed:	RGS
Drawn:	RGS
Checked:	DS
Approved:	DS





**FIGURE 1.2 - SITE MAP - TEAD-004-R-01 - OLD BURN AREA**

**LEGEND**

- MR Site Boundary
- Trench
- / / / / Surface Clear Area



 	
Date:	10/09/2009
Designed:	RGS
Drawn:	RGS
Checked:	DS
Approved:	DS

## 2.2 Contamination as Presented in the 2004 Record of Decision

Low levels of metals and explosives were detected in soil samples collected from various soil borings and test pits at SWMU 6. Lead was identified in a small area within the revetment area and near one of the berms, which corresponds to the former bum trench. The explosive 2,4-dinitrotoluene (2,4-DNT) was located in the drainage ditch that collects runoff from the site. Both lead and 2,4-DNT were identified as industrial contaminants of concern (COCs) at SMWU 6. The soil contaminated with 2,4-DNT in the drainage ditch was subsequently removed and sent offsite for disposal (ECC, 2006).

Under the reasonably anticipated future land use scenarios, lead exceeded the 11.1 ug/dl target blood lead level for construction workers at a hot spot in SWMU 6 (which corresponds to the former bum trench). The identified blood lead level for the hypothetical future construction worker (hot spot only) of 110 ug/dl was above the CDC target of 11.1 ug/dl., and therefore an evaluation of active remediation was required. In addition, because risks and hazards were identified for the hypothetical onsite resident, the UDEQ Risk Rule required that institutional controls be evaluated for SWMU 6. The sitewide ecological RA identified no significant adverse effects on plants or animals.

## 2.3 Selected Remedy in the 2004 Record of Decision

The 2004 ROD for Operable Unit 8 (URS, 2004) included SWMU 6 as well as SWMUs 8, 13, 22, and 36. The ROD specified a remedial action at SWMU 6 that included excavation of soil or waste contaminated with lead above 1,800 mg/kg, treatment to stabilize leachable lead, and disposal in the TEAD landfill. The standards for leachable lead that must be attained to prior to disposal in the landfill is less than 7.5 mg/L lead as determined using the toxicity characteristic leaching procedure (TCLP) (North Wind, 2008).

Elevated concentrations of lead detected in SWMU 6 surface and subsurface soil, as well as elevated concentrations of arsenic in subsurface soil, were associated with the northeast revetment area (3.3 acres). The Final Remediation Goal (FRG) for lead in surface and subsurface soil was determined to be 1,800 mg/kg. The exposure point concentrations (EPCs) for arsenic in both surface and subsurface soil at SWMU 6 were below the FRG for arsenic; therefore, arsenic did not present an unacceptable risk and did not require remediation. The EPCs for lead and 2,4-DNT in surface soil exceeded their FRGs by factors of approximately 2.5 and 1.6, respectively. Therefore, remedial alternatives were specified in the ROD (URS, 2004) for lead in the northeast revetment area. The approximate horizontal extent of potential lead soil contamination, was estimated by assuming that contamination is limited by the berm located along the western edge of the northeast revetment area. Assuming this area (approximately 5,940 ft<sup>2</sup>) and a uniform depth of 10 feet resulted in an estimated total volume of 2,200 bank cubic yards of lead-contaminated soil at SWMU 6.

The feasibility study for OU 8 was performed by Dames and Moore (1999) based on the results of the remedial investigation (Rust E&I, 1995) and human health risk

assessment (Rust E&I, 1997a). Lead was identified as a COC within the northeast revetment area, which is the area within SWMU 6 encompassed by, and including, the revetment berms around the former bum trench. A polygon was defined that represented the area of contaminated soil in excess of the Preliminary Remediation Goal (PRG) for Constmction Workers of 1,800 ug/g for lead. The volume of lead-impacted soil (assuming a uniform depth of 10 feet throughout the polygon) was estimated as 2,200 bank cubic yards.

The following remedial alternatives were developed and evaluated for SWMU 6:

- 1: No action,
- 2: Institutional controls,
- 3: Soil cover,
- 4: Excavation and offsite treatment/disposal,
- 5: Excavation, soil washing, and offsite treatment/disposal, and
- 6: Excavation and solidification/stabilization.

The following EPA-defined criteria were used to perform a detailed analysis of the alternatives developed for SWMU 6:

- Overall protection of human health and the environment  
Evaluates whether a remedial action alternative provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- Compliance with applicable or relevant and appropriate requirements (ARARs)  
Evaluates whether an alternative meets Federal and State ARARs.
- Long-term effectiveness and permanence  
Considers the magnitude of risk posed by the site after implementation of the alternative (residual risk) and the ability of the alternative to reliably protect human health and the environment once cleanup goals (RAOs) are met.
- Reduction of toxicity, mobility, or volume through treatment  
Evaluates the anticipated performance of a treatment technology in terms of reducing the toxicity, mobility, or volume of contamination.
- Short-term effectiveness

Evaluates the speed with which the alternative achieves protection (RAOs), as well as potential adverse effects on human health and the environment during construction or implementation.

- **Implementability**

Assesses the ease with which an alternative may be implemented, including technical and administrative feasibility (e.g., technical aspects of implementation and regulatory approval), and availability of required materials and services.

- **Cost**

Calculates capital, operation and maintenance (O&M), and net present worth costs for each alternative.

Alternatives 4, 5, and 6 were very closely ranked, and each offered long-term and permanent overall protection of human health and the environment. However, Alternative 6 was significantly less costly to implement than Alternatives 4 or 5; therefore, Alternative 6 (excavation and solidification/stabilization) was identified as the highest ranked remedial alternative for SWMU 6. This recommended alternative included the excavation and solidification/stabilization of the lead-contaminated soil. Cement-based stabilization was evaluated in the FS for costing purposes, but the evaluation recognized that other stabilization reagents could be evaluated and used instead. Under this alternative, the stabilized material would be backfilled onsite at SWMU 6.

The ROD (URS, 2004) addressed principal threats at SWMU 6 (as well as lead contamination at the SWMU 8 Small Arms Firing Range) by requiring excavation and solidification/stabilization of contaminated soil, and the application of institutional controls. The selected remedial alternative included excavation and screening of contaminated soil, solidification/stabilization of that soil, backfilling the excavation with clean soil, and placing the stabilized material in a landfill for managing remediation wastes. Confirmation samples will be collected from the excavated area to verify that the contaminated soil has been removed. MEC clearance was expected for excavation activities. A small amount of clean soil from an on-post borrow area would be backfilled into the excavated areas as needed, and the site would be graded and revegetated to its original condition. The OU 8 institutional controls included land use controls (LUCs) that would be implemented and maintained by the Army to prevent residential use of the SWMU and off-site transportation of soil from the SWMU.

Cement was the reagent assumed in the ROD for stabilization of the excavated soil, with the treatment goal of protection of groundwater. The objective of solidification/stabilization was to treat the contaminated soil to below applicable regulatory levels. Treatability testing would be required to evaluate the effectiveness of the technology and to obtain optimum design criteria. The stabilized soil would be placed in the designated landfill in accordance with Utah Administrative Code (UAC) R315-8-21, Use of Corrective Action Management Units. A specific landfill area was designated within the Sanitary Landfill/Pesticide Disposal Area (SWMU 12/15), which is a Known Releases SWMU. At SWMU 12/15, the proposed corrective action is a cover,

groundwater monitoring, and land use controls. As part of the remediation for SWMUs 6 and 8, a soil cover would be placed over the solidified material in the landfill. Confirmation sampling would be performed to verify the stabilization of the soil. Stabilized soil from SWMU 8 has been placed in the landfill and a re-vegetated soil cover constructed (ECC,2005).

#### 2.4 ROD Data Certification Checklist

The following information appears in the Decision Summary section 2 of the ROD. Additional information regarding the OU 8 sites can be found in the TEAD Administrative Record.

(10)1. Commitment by military service to address any situation that may interfere with the effectiveness of LUC: RD Plan Section 4.0 (page 3).

“AR 200-1 defines the Army’s environmental protection program, and establishes policies, procedures, and responsibilities implementing all environmental programs including the restoration of contaminated sites deemed to be a threat to human health and the environment.

At Tooele Army Depot, to ensure that all planned construction activities are accomplished in accordance with the master plan, technical reviews will be conducted on each planned project prior to review by the RPPB.”

(11)2. Commitment by military service to notify EPA of and address any situation that may interfere with the effectiveness of LUC: RD Plan Section 5.0 (page 4).

(12)3. Notification to EPA and the state regarding land use changes: RD Plan Section 5.0 (page 4)

“Annual Inspection Reporting – Within 45 days after the annual inspection, the IRP manager will prepare an inspection report to be submitted to EPA Region 8 and the UDEQ annually. The inspection report will identify any LUC Mechanisms, and any changes to the protective measures identified in Section 4.0 (i.e. perimeter fencing, patrols, and real property planning procedures).”

(13)4. Notification regarding transfers and federal-to-federal transfers: RD Plan Section 6.0, second bullet (page 4).

“The Army will notify EPA and UDEQ in writing 60 days prior to leasing or transferring the property and consult with EPA and UDEQ on specific wording for property lease or transfer documents related to the LUC Objectives.”

(14)5. Concurrence language: The [military service] shall not modify or terminate Land Use Controls, implementation actions, or modify land use without approval by EPA and the [state]. The [military service] shall seek prior concurrence before any anticipated

action that may dismpt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs. RD Plan Section 6.0 (page 4) first bullet.

“The Army shall consult with and obtain concurrence from the EPA and the UDEQ 14 days prior to modification or termination of a LUC Objective or Mechanism or any proposed land use change inconsistent with the LUC Objectives or selected remedy.”

(15)6. Monitoring and reporting language: RD Plan Section 3.0 (page 2).

“Annual Inspection – The TEAD IRP manager will conduct an annual inspection to identify LUC Objective violations and ensure the effectiveness of various LUC Mechanisms. See Section 5.0 for information on the Annual Inspection Report.”

(16)7. A comprehensive list of LUCs. If the description of the LUCs in #5 above is comprehensive, it could substitute for #17's listing of LUCs. RD Plan Section 3.0 (page 1 and 2)

“Site Warning Signs – TEAD will post and maintain signs at the perimeter of each OU 8 site prohibiting excavation of soil without approval of the TEAD Environmental Office.

Installation Master Plan – The OU 8 LUC Sites will be included on an installation wide LUC Site Map as part of the TEAD Installation Master Plan. The LUC Site List and Map will be reviewed and updated as necessary within 45 days of signature of a Record of Decision and on an annual basis.

Annual Inspection – The TEAD IRP manager will conduct an annual inspection to identify LUC Objective violations and ensure the effectiveness of various LUC Mechanisms. See Section 5.0 for information on the Annual Inspection Report.

Five Year Reviews – The IRP manager will prepare a review of the remedy effectiveness no less often once every 5 years after the initiation of the remedial action and submit the report to EPA Region 8 and the Utah Department of Environmental Quality, Division of Environmental Response and Remediation. This review will address the effectiveness of the remedial action and determine whether it's necessary to recommend modification or revocation of TEAD LUC Objectives or Mechanisms.”

(17)8. For active facilities, a description of the intenal procedures for implementing the LUCs (e.g., orders, instmctions, Base Master Plan) and a commitment by the [military service] to notify EPA in advance of any changes to the intenal procedures that would affect the LUCs. RD Plan Section 3.0 (page 1 and 2) second bullet.

“Installation Master Plan – The OU 8 LUC Sites will be included on an installation wide LUC Site Map as part of the TEAD Installation Master Plan. The LUC Site List and Map will be reviewed and updated as necessary within 45 days of signature of a Record of Decision and on an annual basis.”

Generally, #s 9 and 10 apply at a BRAC installation, but they may have application elsewhere.

(18)9. Other property transfer language: RD Plan Section 6.0, second bullet (page 4).

“The Army will notify EPA and UDEQ in writing 60 days prior to leasing or transferring the property and consult with EPA and UDEQ on specific wording for property lease or transfer documents related to the LUC Objectives.”

(19). Ensure that the document adequately describes pre-transfer LUCs, not just post transfer LUCs. RD Plan Section 6.0 (page 4).

“The Army shall consult with and obtain concurrence from the EPA and the UDEQ 14 days prior to modification or termination of a LUC Objective or Mechanism or any proposed land use change inconsistent with the LUC Objectives or selected remedy.

The Army will notify EPA and UDEQ in writing 60 days prior to leasing or transferring the property and consult with EPA and UDEQ on specific wording for property lease or transfer documents related to the LUC Objectives.”

### 3.0 BASIS FOR THIS DOCUMENT

#### 3.1 Treatability Study

The results of the supplemental characterization (North Wind, 2008) were used to identify site soils from SWMU 6 with relatively high leachable lead concentration and a total lead concentration greater than the 1,800 mg/kg cleanup level. The effectiveness of a phosphate reagent for stabilizing lead in this material was then evaluated by completing a bench-scale treatability study (North Wind, 2009).

Most of the treatability study was performed using soil that had been sieved to remove particles and debris larger than ½-inch, and homogenized to reduce heterogeneity between specimens. The total lead concentration in the sample was 13,000 mg/kg, and TCLP lead was approximately 700 mg/L, which was well above the stabilization criterion for lead of 7.5 mg/L. In contrast, the SPLP lead in the sample was 0.4 mg/L, which was well below the stabilization criterion of 75 mg/L. Therefore, stabilization treatment would be required to meet the TCLP criterion for leachable lead, but not the SPLP criterion.

The effectiveness of treating the soil with phosphate was evaluated by dosing the soil with various concentrations of a phosphate reagent, and measuring leachable lead by TCLP and SPLP, as well as soil pH. The principal of phosphate-based stabilization involves reaction with soluble lead and precipitation of low-solubility lead minerals (such as pyromorphite). Agricultural fertilizer grade material that contained 75% phosphoric acid was used as the source of phosphate (Simplot 0-55-0 phosphoric acid).

The lowest loading of phosphoric acid that resulted in TCLP lead results below the stabilization criterion was 20 grams of 75% acid stock solution per kilogram soil, which resulted in an average leachable lead concentration of 4.7 mg/L, which is below the stabilization criterion. SPLP-lead was below the stabilization criterion in both untreated and phosphate treated soil. These results demonstrate that lead in soil at SWMU 6 can be stabilized by adding a sufficient dose of phosphoric acid. Water was reportedly also added to the bench-scale samples, but the amount of water added was not reported.

Adding sodium chloride did not significantly reduce the TCLP leachable lead concentrations; however, sodium chloride was not tested at phosphate doses near 20 g/kg. Adding 1% by weight calcium carbonate (limestone) reduced the TCLP leachable lead concentrations from 3.7 mg/L to 2.1 mg/L (approximately 40%). Adding 1% by weight bone char (apatite) reduced TCLP leachable lead concentrations from 3.7 mg/L to 3.3 mg/L (approximately 10%). Therefore, the results indicate that these granular amendments could have some slight enhancement to the effectiveness of phosphate stabilization. The presence of oversize particles and metallic lead did not interfere with the effectiveness of phosphate stabilization using the phosphoric acid dose of 20 g/kg. The soil samples fzzed, and soil pH was lowered, during the mixing of phosphoric acid amendments to the soil in the laboratory, indicating reaction of the acid with the alkaline

site soils. For the phosphoric acid dosage of 20 g/kg, the soil pH was reduced from an average of 9.3 to an average of 5.49. The monitoring of soil pH may also be an effective field monitoring tool for assessing the effectiveness of stabilization treatment with phosphoric acid.

### 3.2 Differences from Selected Remedy

The results of additional characterization and treatability study testing are summarized above. The supplemental characterization report found that both surficial and shallow soil and large portions of the buried debris would require removal and treatment to comply with the Remedial Action Objective (RAO). The treatability study was successful in using phosphoric acid to stabilize lead in sieved soil with minor amounts of debris that was less than 1/2-inch in size. However, the characterization reports indicate that most of the buried debris is larger than the 1/2-inch fraction that was treated. Although the treatability study indicated that the application of phosphoric acid should also work on the larger debris, this was never tested in the laboratory or in the field. Due to this uncertainty, the Army has concluded that without additional treatability testing to confirm the effectiveness of the proposed addition of phosphoric acid, significant uncertainty exists regarding the success of stabilizing lead in both the soil and larger debris using this process.

Due to uncertainty associated with stabilization of leachable lead in debris from this site, and the general safety hazards inherent the implementation associated with handling and applying the large volumes of phosphoric acid that would be needed for treatment, The Army has developed the remedial action approach assuming off-site disposal of soil and debris in an appropriately permitted TSDF. Parsons will satisfy the PWS and meet the RAO by excavating, testing, manifesting, and transporting soil and debris with lead that exceeds the 1,800 ppm cleanup criterion from TEAD-004-R-01 to the Clean Harbors Grassy Mountain hazardous and industrial waste landfills.

## 4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES

An assessment of performance for each alternative considered for the remediation of SWMU 6 is summarized in Table 2.2 of the OU 8 ROD (URS, 2004). This table is reproduced herein (in this ESD) as Table 4.1. In Table 4.1, each alternative is assessed against evaluation criteria as recommended by CERCLA guidance (USEPA, 1990) and described in Section 2.3 of this document.

The two threshold criteria relate to the requirements that each alternative must satisfy for to be eligible for selection. In the five primary balancing criteria, each alternative is considered, and rated as "low," "moderate," or "high" in meeting each balancing criterion. Balancing criteria can be used to rank each alternative. Table 4.1 includes evaluations and ranking of both the ROD-selected alternative and alternative as now proposed as Alternatives 6 and 4 respectively. Both the previously selected alternative and the newly selected alternative are presented for evaluation.

The only significant difference is disposing of excavated soil and debris from SWMU 6 in an off-depot Hazardous waste landfill (Table 4.1, Alternative 4) rather than the on-depot landfill (Table 4-1, Alternative 6). Details regarding these evaluations are presented below.

### 4.1 Disposal Alternative as Presented in the ROD (URS, 2004)

#### 4.1.1 Scope

The ROD specified a remedial action at SWMU 6 that included excavation of soil or waste contaminated with lead above 1,800 mg/kg, treatment to stabilize leachable lead, and disposal in the TEAD landfill.

#### 4.1.2 Performance

The anticipated performance of Alternative 6 was summarized in the Relative Ranking Summary that was presented in the ROD for Operable Unit 8.

As shown in Table 4.1, Alternative 6 (The ROD Selected Alternative) was rated, "high" for:

- Overall protection of human health and the environment and;
- Compliance with ARARS.

Alternative 6 was rated, "moderate" for:

- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, and volume through treatment;
- Short-term effectiveness; and
- Implementability.

**TABLE 4.1**

**Relative Ranking of Remedial Alternatives  
Old Burn Area (SWMU 6)<sup>(a)</sup>**

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
	No Action	Institutional Controls	Soil Cover	Excavation and Off-Post Treatment/ Disposal	Excavation, Soil Washing and Off-Post Treatment/ Disposal	Excavation and Solidification/ Stabilization
Overall protection of human health and the environment	○	◐	●	●	●	●
Compliance with ARARs	○	●	●	●	●	●
Long-term effectiveness and permanence	○	◐	◐	●	●	◐
Reduction of toxicity, mobility, and volume through treatment	No treatment	No treatment	○	◐	●	◐
Short-term effectiveness	●	●	◐	◐	◐	◐
Implementability	◐	●	◐	●	◐	◐
Cost	\$0	\$64,600	\$114,300	\$2,431,200	\$2,748,900	\$1,106,300

(a) Rankings of high, moderate, or low indicate how well each alternative meets each evaluation criterion when compared.

High ●      Moderate ◐      Low ○

#### 4.1.3 Cost

The cost for Alternative 6 was estimated at \$1,106,300.

### 4.2 Disposal Alternative as Now Proposed

#### 4.2.1 Scope

The Army has developed the remedial action approach assuming off-site disposal of soil and debris in an appropriately permitted TSDF.

#### 4.2.2 Performance

An assessment of performance for Alternative 4 is also summarized in table 4.1. As shown in Table 4.1, Alternative 4 was rated, "high" for:

- Long-term effectiveness and permanence;
- Implementability;
- Overall protection of human health and the environment; and
- Compliance with ARARS.

Off-depot (Alternative 4) was rated, "moderate" for:

- Reduction of toxicity, mobility, and volume through treatment; and
- Short-term effectiveness.

#### 4.2.3 Cost

The cost for off-depot was estimated at \$2,431,200 in the ROD (URS, 2004). Revised estimates by The Army are \$1,075,000.

### 4.3 Benefits of Off-Depot and On-Depot Disposal

#### 4.3.1 Off-Depot Disposal

The off-depot disposal alternative was ranked higher than the on-depot disposal alternative for both

- Long-term effectiveness and permanence; and
- Implementability.

With the exception of cost (as described above), all other evaluation criteria were equal for the two alternatives.

#### 4.3.2 On-Depot Disposal

Only the cost criteria for the on-depot disposal alternative was rated above the off-depot disposal alternative (see Table 4-1).

#### 4.4 Changes in Expected Outcomes

As a result of the proposed change, the following outcomes will result:

- The long-term effectiveness and permanence of the remedy will be greater;
- The remedy will be more easily implemented; and
- Although originally estimated as more costly, the off-depot disposal alternative cost is about the same as for on-depot disposal in the TEAD landfill.
- All other components of the remedy will remain the same.

## 5.0 SUPPORT AGENCY COMMENTS

Comments and responses to comments from the UDEQ are included as Attachment 1 to this ESD.

## 6.0 PUBLIC PARTICIPATION COMPLIANCE

Once regulatory acceptance is achieved, public participation will be in accordance with National Contingency Plan 300.435 (c)(2)(i). Specifically, this ESD will be included in the public record for the Tooele Army Depot and a notice that briefly summarizes the ESD and the reasons for the differences will be published in the local Tooele Transcript Bulletin.

## 7.0 STATUTORY DETERMINATIONS

The selected remedy as modified in this ESD satisfies CERCLA §121 and remains protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to hazardous substances which are part of this response action, and is cost-effective.

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TEAD:

*Yolanda C. Dennis-Lowman*  
 Yolanda C. Dennis-Lowman  
 COL, NG Commanding  
 Tooele Army Depot

17 Mar 10  
 Date

U.S. EPA:

*Eddie A. Sierra*  
 Eddie A. Sierra  
 Acting Assistant Regional Administrator  
 Office of Ecosystems Protection and Remediation

04/01/2010  
 Date

UDEQ:

*Amanda Smith*  
 Amanda Smith  
 Executive Director  
 Utah Department of Environmental Quality

4/8/10  
 Date

## 8.0 REFERENCES

- Dames and Moore. 1999. *Feasibility Study Report, Operable Units 4 and 8, Tooele Army Depot, Tooele, Utah*. Prepared for Tooele Army Depot under Contract No. DACA31-94-D-0060, Delivery Order 1. Revised final. December.
- Environmental Chemical Corporation (ECC). 2005. *Completion Report, Corrective Measures Implementation at Solid Waste Management Unit (SWMU) 8, Small Arms Firing Range, Tooele Army Depot (TEAD), Tooele, Utah*. Prepared for U.S. Army Corps of Engineers, Sacramento District under Contract Number DACA05-99-D-0013, TO CM06. Draft Final. November.
- Environmental Chemical Corporation (ECC). 2006. *Interim Remedial Action Completion Report, Corrective Measures Implementation at Solid Waste Management Unit (SWMU) 6, Old Burn Area, Tooele Army Depot (TEAD), Tooele, Utah*. Prepared for U.S. Army Corps of Engineers, Sacramento District under Contract Number DACA05-99-D-0013, TO CM06. Draft Final. January.
- North Wind Inc.. 2008. *Supplemental Characterization Report, Leachable Lead in Waste and Soil at Solid Waste Management Unit 6, Tooele Army Depot, Tooele, Utah*. Prepared for U.S. Army Corps of Engineers, Sacramento District. November.
- North Wind Inc.. 2009. *Laboratory Treatability Study Report, Evaluation of Phosphate-Base Stabilization of Lead-Contaminated Soil, Solid Waste Management Unit 6, Tooele Army Depot, Tooele, Utah*. Letter report prepared for U.S. Army Corps of Engineers, Sacramento District. March 30.
- Rust E&I. 1995. *Revised Final Phase II RCRA Facility Investigation Report for Known Releases SWMUs, Tooele Army Depot-North Area*. Prepared for USAEC, Aberdeen Proving Ground, Maryland.
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- URS. 2004. *Record of Decision, Operable Unit 8, Tooele Army Depot, Tooele, Utah, Dated January 2004*.
- USEPA, 1990. *The Feasibility Study: Detailed Analysis of Remedial Action Alternatives, OSWER Directive NO.: 9355-3-01SF4*. March, 1990.
- USATHAMA (U.S. Army Toxic and Hazardous Materials Agency), 1979. *Installation Assessment of Tooele Army Depot, Report No. 141*.

**ATTACHMENT 1**  
**SUPPORT AGENCY COMMENTS AND RESPONSES**

**RESPONSE TO COMMENTS ON DRAFT VERSION OF  
EXPLANATION OF SIGNIFICANT DIFFERENCES FOR THE RECORD OF DECISION  
OPERABLE UNIT 8, SWMU 6, TOOEELE ARMY DEPOT**

<b>Date: February 11, 2010</b>			
<b>Comments from Rik Ombach, Utah Department of Environmental Quality</b>			
<b>Comment #</b>	<b>Comment</b>	<b>Reference</b>	<b>Response to Comment</b>
<b>General Comments:</b>			
1	Please include a signature page (or pages) in the final version for signature by the EPA, UDEQ and the Army.	General	Signature Page has been added as requested (see Section 7.0).
<b>Specific Comments:</b>			
2	Please reword this sentence to include what exactly was signed by Tooele Army Depot in January 2004.	Page 1, first paragraph, last sentence	Text has been changed to specify that the ROD was signed by the Tooele Army Depot.
3	Please clarify that the lead agency for this decision is the Army or Tooele Army Depot and the EPA and the UDEQ are the regulatory agencies.	Page 1, second paragraph, second sentence	Text has been modified to show the Tooele Army Depot as the lead agency.
4	Please note that the UDEQ does not maintain the Administrative Record for Tooele Army Depot. We do have records available for request, but they are not maintained in accordance with the Administrative Record requirements.	Page 1, last paragraph	The text showing UDEQ as maintaining and holding a copy of the administrative record has been deleted.
5	Please define TEAD.	Page 2, section 2.1,	Corrected as requested

**RESPONSE TO COMMENTS ON DRAFT VERSION OF  
EXPLANATION OF SIGNIFICANT DIFFERENCES FOR THE RECORD OF DECISION  
OPERABLE UNIT 8, SWMU 6, TOOELE ARMY DEPOT**

		first sentence	
6	Please define SWMU.	Page 2, section 2.1, second paragraph, third sentence	Corrected as requested
7	Please condense the two discussions concerning the 17 CERCLA SWMU's.	Page 2, section 2.1, second and third paragraph	Text concerning the 17 CERCLA SWMU's has been condensed into one paragraph.
8	Since the 75 mg/L SPLP discussion was not included in the ROD and is not applicable to this document, please remove this discussion.	Page 5, section 2.3, first paragraph	Text involving the discussion of 75 mg/L SPLP has been deleted as requested.
9	Please rewrite the last sentence to clarify that the previously selected alternative and the newly selected alternative are both presented for evaluation.	Page 11, section 4.0, first paragraph, last sentence	Another Sentence has been added to the second paragraph on Section 4.0 to explain in more detail that both the newly selected alternative and the previously selected alternative are both presented for evaluation.
10	Please include a reference explaining that the first two evaluation criteria are threshold criteria that must be met in any chosen action. The remaining criteria are balancing criteria. Alternatives can be ranked based on how well they meet the	Page 11, section 4.1.2 and 4.2.2	Text has been rewritten as requested and now describes the evaluation criterion and that the balancing criteria can be used to rank the alternatives. A reference to CERCLA guidance has also been added to this section (see Section 4.0, paragraphs 1 and 2).

**RESPONSE TO COMMENTS ON DRAFT VERSION OF  
EXPLANATION OF SIGNIFICANT DIFFERENCES FOR THE RECORD OF DECISION  
OPERABLE UNIT 8, SWMU 6, TOOELE ARMY DEPOT**

	balancing criteria.		
<b>Date: February 17, 2010</b>			
<b>Comments from Jim Kiefer, US Environmental Protection Agency</b>			
1	The document makes several references to conclusions and discussions made by Parsons. These conclusions and discussions are really the Army's discussions and probably were made with the information provided by and with the assistance of Parsons. Please review these references on the following pages:	<p>Page 1, Section 1.0, 3<sup>rd</sup> Paragraph;</p> <p>Page 10, Section 3.2, 1<sup>st</sup> &amp; 2<sup>nd</sup> Paragraphs;</p> <p>Page 13, Section 4.2.1;</p> <p>Page 13, Section 4.2.3</p>	References to "Parsons" changed to, "the Army," as requested.