TOOELE
ARMY
DEPOT

REVISED FINAL

DECISION DOCUMENT
GROUP C SUSPECTED RELEASES SWMUs
TOOELE ARMY DEPOT
TOOELE, UTAH

Contract No. DACA31-94-D-0060
Delivery Order No. 1

Prepared for:

TOOELE ARMY DEPOT
Tooele, Utah

Prepared by:

URS
Dames & Moore
7101 Wisconsin Avenue, Suite 700
Bethesda, Maryland 20814

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APPROVED FOR PUBLIC RELEASE

JANUARY 2002

Printed on Recycled Paper

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January 2002

Tooele Army Depot

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Final Decision Document

for Group C Solid Waste Management Units 49, 50, 51, 52, 54, 56, and 57

The Decision Document

After completion of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and Corrective Measures Study (CMS) for the Group C Solid Waste Management Units (SWMUs), the Tooele Army Depot (TEAD) has identified preferred corrective measures alternatives for soil contamination. The following corrective measures are put forth as initial recommendations only, not as final decisions, for public comment:

? SWMU 49 (Stormwater/Industrial Wastewater Piping)
- Sewer Line-Southern Area: Deed restrictions to prevent residential use of the site ($12,000)
- Sewer Line-Central Area: Deed restrictions to prevent residential use of the site ($12,000)
- Sewer Line-Northern Area: Deed restrictions to prevent residential use of the site ($12,000)
- Building 609: No action ($0)
- B Avenue Outfall: Deed restrictions to prevent residential use of the site ($12,000)
- G Avenue Outfall: Excavation, off-post treatment/disposal, and deed restrictions to prevent residential use of the site ($73,000)
- H Avenue Outfall: Deed restrictions to prevent residential use of the site ($12,000)
- J Avenue Outfall: Deed restrictions to prevent residential use of the site ($12,000)
- K Avenue Outfall: Deed restrictions to prevent residential use of the site ($12,000)

? SWMU 50 (Compressor Condensate Drains, Buildings 613 and 619)
- Building 613 Drain: Deed restrictions to prevent residential use of the site ($12,000)
- Building 619 Drain: Deed restrictions to prevent residential use of the site ($12,000)

? SWMU 51 (Chromic Acid/ Alodine Drying Beds): Deed restrictions to prevent residential use of the site ($12,000)

? SWMU 52 (Possible Drain Field/Disposal Trenches)
- 52B Disposal Trenches: Deed restrictions to limit residential use of the site ($12,000)
- 52C Charcoal Material Area: Excavation and off-post treatment/disposal ($550,000)
- 52D Horse Stable Area: Excavation and off-post treatment/disposal ($41,000)

? SWMU 54 (Sandblast Areas)
- Building 604: No action ($0)
- Building 611: Excavation, off-post treatment/disposal, and deed restrictions to prevent residential use of the site ($120,000)
- Building 637: Deed restrictions to prevent residential use of the site ($12,000)

? SWMU 56 (Gravel Pit): Excavation and off-post treatment/disposal ($240,000)

? SWMU 57 (Skeet Range): Excavation and off-post treatment/disposal ($1,400,000)

Figure 2, page 5, of this Decision Document shows the location of each Group C SWMU addressed herein.

These proposed corrective measures will significantly reduce risk to human health and the environment.

A public meeting to discuss the corrective measures proposed for the Solid Waste Management Units in this Decision Document will be announced to the public in the local newspaper. Anyone desiring personal notification of this or other environmental meetings should return the Mailing List form on page 67. If you should have any questions, or would like additional information, please feel free to contact Larry McFarland of the Tooele Army Depot Environmental Office at (435) 833-3504.

The Community's Role in the Selection Process

How to Submit a Formal Comment

The Army solicits input from the community on the actions proposed in this Decision Document. A comment period is established to encourage public participation in this process. At the public meeting, the Army will present the results of the RFI, the CMS, and the Decision Document; answer questions; and accept both oral and written comments. Representatives of EPA and the State of Utah will be present to answer questions.

During the public comment period, you may submit a formal comment in any of the following ways:

1. Mail written comments to:

   Tooele Army Depot
   Attn: SDSTE-IRE/Larry McFarland
   Environmental Management Division
   Building T8
   Tooele, UT 84074-5000

2. Fax written comments to: (435) 833-2839.

3. Offer verbal comments during the public hearing.

Please note that there is a distinction between formal comments received during the public comment period and informal comments received outside of the comment period. Although TEAD will respond to all comments regardless of when they are received, only the formal comments postmarked by August 30, 2001, and TEAD's responses to those comments will be addressed in the responsiveness summary.

Formal comments become part of the official public record. TEAD will consider all formal comments received during the public comment period prior to making the final decision for each site.

All formal comments and TEAD's written responses will accompany the Final Decision Document for the Group C SWMUs. Copies of the responses will be mailed to anyone who submits a formal comment. In addition, TEAD will announce the decision through the local news media and the mailing list. (A form for requesting addition of your name to the mailing list is included as page 67 of this document).

Upon timely request, the comment period may be extended for 30 days. Such a request should be submitted in writing to TEAD. The request must be received no later than August 15, 2001.

For More Information

The Decision Document for the Group C SWMUs highlights information that can be found in greater detail in the RFI Report, the CMS Report, and other available reports. These reports are contained in the TEAD Administrative Record.

The Decision Document will be added to the Administrative Record upon completion. The Army encourages the public to review and comment on these supporting documents, which are available at the following locations:

Tooele Army Depot
Public Affairs Office
T-1 Headquarters Building
Tooele Army Depot, UT 84074

Tooele Public Library
47 East Vine Street
Tooele, UT 84112

Marriott Library
University of Utah
372 S. Marriott
Salt Lake City, UT 84112

Grantsville Public Library
198 West Main Street
Grantsville, UT 84029

STORMWATER/INDUSTRIAL WASTEWATER PIPING (SWMU 49)

SWMU 49 consists of the existing stormwater system piping and outfalls located throughout the Maintenance Area of TEAD. It also includes Building 609, a former Steam Cleaning/Radiator Repair Facility located in the southeast section of the Maintenance Area. Large amounts of wastewater were produced at this facility during previous operations, which may have affected the stormwater/industrial wastewater system. Because of the large area occupied by the piping, SWMU 49 was evaluated as nine separate areas, as discussed below.

Soil samples were collected to determine if contamination exists due to previous activities. The only contaminants of concern were metals at the Sewer Line – Southern Area and semivolatile organic compounds at the Sewer Line – Central Area and G Avenue Outfall.

Based on the sampling conducted at SWMU 49, none of the nine areas have elevated cancer risks or hazards for current (and realistic future) industrial workers or future construction workers. However, all nine of the areas have elevated cancer risks or hazards for hypothetical future onsite residents.

The sitewide ecological assessment determined that none of the SWMU 49 areas pose unacceptable ecological risk.

The reasonably anticipated future land use of SWMU 49 is industrial. To protect against future residential use, deed restrictions are recommended at every subarea. Excavation and off-post treatment/disposal is also recommended at G Avenue Outfall for approximately 135 cubic yards of contaminated soil.

Comparative Analysis of Alternatives
Stormwater/Industrial Wastewater Piping (SWMU 49)

Evaluation Criterion (a)		Sewer Line – Southern Area		Sewer Line – Central Area		Sewer Line – Northern Area	Building 609
		Alt. 1: Deed Restrictions (b)	Alt. 2: Excavation, Off-Post Treatment/ Disposal, and Deed Restrictions	Alt. 1: Deed Restrictions (b)	Alt. 2: Excavation, Off-Post Treatment/ Disposal, and Deed Restrictions	Deed Restrictions	No Action
Technical	Performance	High	High	High	High	High	High
	Reliability	High	High	High	High	High	High
	Implementability	High	Moderate	High	Moderate	High	High
	Safety	High	Moderate	High	Moderate	High	High
Human health assessment		High	High	High	High	High	High
Environmental assessment		High	High	High	High	High	High
Administrative feasibility		High	High	High	High	High	High
Cost		$12,000	$47,000	$12,000	$52,000	$12,000	$0
Relevant section in Corrective Measures Study		3.1.2.1	3.1.2.2	3.2.2.1	3.2.2.2	3.3.2	3.4.1

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.
(b) Recommended alternative for Sewer Line – Southern Area, Sewer Line – Central Area, and G Avenue Outfall.

For more information about SWMU 49, see pages 19 to 31, and Table 1 on page 56 in this Decision Document.

Comparative Analysis of Alternatives Stormwater/Industrial Wastewater Piping (SWMU 49) (cont'd)							
		B Avenue Outfall	G Avenue Outfall		H Avenue Outfall	J Avenue Outfall	K Avenue Outfall
	Evaluation Criterion (a)	Deed Restrictions	Alt. 1: Deed Restrictions	Alt. 2: Excavation, Off-Post Treatment/ Disposal, and Deed Restrictions (b)	Deed Restrictions	Deed Restrictions	Deed Restrictions
Technical	Performance	High	High	High	High	High	High
Technical	Reliability	High	High	High	High	High	High
Technical	Implementability	High	High	High	High	High	High
Technical	Safety	High	High	Moderate	High	High	High
Human health assessment		High	Moderate	High	High	High	High
Environmental assessment		High	Moderate	High	High	High	High
Administrative feasibility		High	High	High	High	High	High
Cost		$12,000	$12,000	$73,000	$12,000	$12,000	$12,000
Relevant section in Corrective Measures Study		3.5.2	3.6.2.1	3.6.2.2	3.7.2	3.8.2	3.9.2

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.
(b) Recommended alternative for G Avenue Outfall.

For more information about SWMU 49, see pages 19 to 31, and Table 1 on page 56 in this Decision Document.

COMPRESSOR CONDENSATE DRAINS, BUILDINGS 613 AND 619 (SWMU 50)

SWMU 50 consists of two compressor condensate drains located adjacent to Buildings 613 and 619, which housed large air compressors associated with the vehicle maintenance mission of TEAD. Because these two buildings are 800 to 1,000 feet apart, each area was evaluated separately.

Soil samples were collected to determine if contamination exists due to previous activities. The only contaminant of concern found at SWMU 50 was arsenic. It was detected at the Building 619 drain.

Based on the sampling conducted at SWMU 50, there are no elevated cancer risks or hazards for current (and realistic future) industrial workers or future construction workers. However, at the Building 613 drain, elevated hazards exist for hypothetical future onsite residents. At the Building 619 drain, elevated cancer risks and hazards exist for hypothetical future onsite residents.

The sitewide ecological assessment determined that SWMU 50 poses a low ecological risk.

The reasonably anticipated future land use of SWMU 50 is industrial. To protect against future residential use, deed restrictions are recommended.

Comparative Analysis of Alternatives
Compressor Condensate Drains, Buildings 613 and 619
(SWMU 50)

Evaluation Criterion (a)		Building 613	Building 619	
		Deed Restrictions	Alt. 1: Deed Restrictions (b)	Alt. 2: Excavation and Off-Post Treatment/ Disposal
Technical	Performance	High	High	High
	Reliability	High	High	High
	Implementability	High	High	Moderate
	Safety	High	High	Moderate
Human health assessment		High	High	High
Environmental assessment		High	High	High
Administrative feasibility		High	High	High
Cost		$12,000	$12,000	$26,000
Relevant section in Corrective Measures Study		4.1.2	4.2.2.1	4.2.2.2

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.
(b) Recommended alternative for Building 619.

For more information about SWMU 50, see pages 32 to 35, and Table 1 on page 56 in this Decision Document.

CHROMIC ACID/ALODINE DRYING BEDS (SWMU 51)

SWMU 51 consists of four concrete pads near the western edge of the Maintenance Area. The site is no longer used; however, during the 1970s, the pads were used as drying beds for disposal of chromic acid and alodine wastes. Radiator and engine fluids may have also been flushed/drained at the pads.

Soil samples were collected to determine if contamination exists due to previous activities. No contaminants of concern were found in these soil samples.

Based on the sampling conducted at SWMU 51, there are no elevated cancer risks or hazards for current (and realistic future) industrial workers or future construction workers. However, elevated cancer risks and hazards exist for hypothetical future onsite residents.

The sitewide ecological assessment determined that SWMU 51 poses a moderate but not unacceptable ecological risk.

The reasonably anticipated future land use of SWMU 51 is industrial. To protect against future residential use, deed restrictions are recommended.

Comparative Analysis of Alternatives
Chromic Acid/Alodine Drying Beds (SWMU 51)

Evaluation Criterion (a)		Deed Restrictions
Technical	Performance	High
	Reliability	High
	Implementability	High
	Safety	High
Human health assessment		High
Environmental assessment		High
Administrative feasibility		High
Cost		$12,000
Relevant section in Corrective Measures Study		5.2

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.

For more information about SWMU 51, see pages 36 to 37, and Table 1 on page 56 in this Decision Document.

POSSIBLE DRAIN FIELD/DISPOSAL TRENCHES (SWMU 52)

SWMU 52 is located within the Administration Area of TEAD. Three different areas were evaluated as part of this SWMU. The Disposal Trenches (SWMU 52B) consist of a long mounded trench, approximately 150 by 40 feet, and several smaller mounds. Pieces of construction rubble and debris are present at the surface of the mounds and are buried throughout the area. The Charcoal Material Area (SWMU 52C) consists of charcoal material distributed in various-sized piles throughout an area of approximately 19.5 acres. The Horse Stable Area (SWMU 52D) was identified as an area of interest because several pesticides had been detected in surface soil samples collected during an earlier investigation.

Soil samples were collected to determine if contamination exists due to previous activities. Contaminants of concern were semivolatile organic compounds at the Charcoal Material Area and pesticides at the Horse Stable Area.

Based on the sampling conducted at SWMU 52, there are elevated cancer risks and hazards for realistic future onsite adult and child residents at the Disposal Trenches and Charcoal Material Area. Elevated cancer risks exist for realistic future onsite adult and child residents at the Horse Stable Area.

The sitewide ecological assessment determined that the SWMU 52 areas pose a low ecological risk.

The reasonably anticipated future land use of SWMU 52 is residential. The Charcoal Material Area and Horse Stable Area require corrective action and excavation with off-post treatment/disposal is recommended. The estimated volumes of contamination are 1,890 cubic yards and 28 cubic yards, respectively.

Comparative Analysis of Alternatives
Possible Drain Field/Disposal Trenches (SWMU 52)

		Disposal Trenches (SWMU 52B)	Charcoal Material Area (SWMU 52C)	Horse Stable Area (SWMU 52D)
	Evaluation Criterion (a)	**Deed Restrictions**	**Excavation and Off-Post Treatment/ Disposal**	**Excavation and Off-Post Treatment/ Disposal**
Technical	Performance	High	High	High
	Reliability	High	High	High
	Implementability	High	High	High
	Safety	High	High	High
Human health assessment		High	High	High
Environmental assessment		High	High	High
Administrative feasibility		High	High	High
Cost		$12,000	$550,000	$41,000
Relevant section in Corrective Measures Study		6.1.2	6.2.2	6.3.2

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.

For more information about SWMU 52, see pages 38 to 43, and Table 1 on page 56 in this Decision Document.

SANDBLAST AREAS (SWMU 54)

SWMU 54 is located within the Maintenance Area of TEAD. This SWMU includes three buildings where sandblasting occurred – Building 604, Power Train and Special Equipment Branch; Building 611, Military Standard Engine and Small Generator Overhaul; and Building 637, Engine Rebuild. Three types of sandblast media (i.e., steel grit, ground walnut shells, and glass beads) were used. The spent media had the consistency of fine dust and was collected outside in sealed hoppers.

Soil samples were collected to determine if contamination exists due to previous activities. Contaminants of concern include metals at Building 611 and semivolatile organic compounds at Building 637.

Based on the sampling conducted at SWMU 54, elevated blood lead levels exist only at Building 611 for current (and realistic future) industrial workers and future construction workers. However, all three areas have elevated cancer risks and hazards for hypothetical future onsite residents. There are also elevated blood lead levels at Building 611 for hypothetical future child residents.

The sitewide ecological assessment determined that the SWMU 54 areas pose a low ecological risk.

The reasonably anticipated future land use of SWMU 54 is industrial. No action is required at Building 604. Excavation and off-post treatment/disposal is recommended at Building 611; the estimated volume of contamination is 160 cubic yards. Deed restrictions to prevent residential use are recommended at Building 637.

Comparative Analysis of Alternatives
Sandblast Areas (SWMU 54)

Evaluation Criterion (a)		Building 604	Building 611			Building 637
		No Action	Alt. 1: Excavation, Off-Post Treatment/ Disposal, and Deed Restrictions (b)	Alt. 2: Excavation, Soil Washing, and Deed Restrictions	Alt. 3: Excavation, Solidification/ Stabilization, and Deed Restrictions	Deed Restrictions
Technical	Performance	High	High	Moderate	Moderate	High
	Reliability	High	High	Moderate	Moderate	High
	Implementability	High	High	Moderate	Moderate	High
	Safety	High	Moderate	Moderate	Moderate	High
Human health assessment		High	High	High	High	High
Environmental assessment		High	High	High	High	High
Administrative feasibility		High	High	Moderate	Moderate	High
Cost		$0	$120,000	$260,000	$210,000	$12,000
Relevant section in Corrective Measures Study		7.1.1	7.2.2.1	7.2.2.2	7.2.2.3	7.3.2

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.
(b) Recommended corrective measures alternative for Building 611, SWMU 54.

For more information about SWMU 54, see pages 44 to 48, and Table 1 on page 56 in this Decision Document.

GRAVEL PIT (SWMU 56)

The Gravel Pit is located within the Maintenance Area of TEAD. This SWMU is a low-lying area, approximately 4 acres in size. It is covered with residual piles of cobbles, vehicle components, and containers; a smaller area of discolored soil is referred to as the Burned Area.

Test pits were excavated and soil samples were collected to determine if contamination exists due to previous activities or due to the identified debris. Elevated concentrations of metals were detected; however, these concentrations were below criteria for industrial use of the site.

Based on the sampling conducted at SWMU 56, there are elevated hazards for current (and realistic future) industrial workers and elevated blood lead levels for future construction workers. For hypothetical future onsite residents, elevated cancer risks, hazards, and blood lead levels (child only) were identified.

The sitewide ecological assessment determined that SWMU 56 poses a moderate but not unacceptable ecological risk.

The reasonably anticipated future land use of the Gravel Pit is industrial. The recommended action is excavation and off-post treatment/disposal at SWMU 56; the estimated volume of Burned Area soil slated for removal is 400 cubic yards.

Comparative Analysis of Alternatives
Gravel Pit (SWMU 56)

Evaluation Criterion (a)		Alt. 1: Deed Restrictions	Alt. 2: Excavation and Off-Post Treatment/ Disposal (b)
Technical	Performance	Low	High
	Reliability	High	High
	Implementability	High	High
	Safety	High	Moderate
Human health assessment		Low	High
Environmental assessment		Moderate	High
Administrative feasibility		Low	High
Cost		$12,000	$240,000
Relevant section in Corrective Measures Study		8.2.1	8.2.2

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.
(b) Recommended corrective measures alternative for SWMU 56.

For more information about SWMU 56, see pages 49 to 51, and Table 1 on page 56 in this Decision Document.

SKEET RANGE (SWMU 57)

The Skeet Range was used for skeet and trap shooting beginning in 1978. It is located in the northern portion of the Administration Area of TEAD, within the BRAC parcel. At the time of the RFI, skeet shooting consisted of occasional competitions and infrequent target practice. The range no longer operates.

Soil samples were collected to determine if contamination exists due to previous activities. Elevated levels of metals were found in an area of SWMU 57 containing lead shot, and elevated levels of polycyclic aromatic hydrocarbons were found in an area containing clay target fragments.

Based on the sampling conducted at SWMU 57, elevated cancer risks and hazards exist for realistic future onsite adult and child residents, and elevated blood lead levels exist for realistic child residents.

The sitewide ecological assessment determined that SWMU 57 potentially presents an unacceptable ecological risk.

The reasonably anticipated future land use of the Skeet Range is residential. SWMU 57 requires corrective action and excavation with off-post treatment/disposal is recommended; the estimated volume of contaminated soil is 3,520 cubic yards.

Comparative Analysis of Alternatives
Skeet Range (SWMU 57)

Evaluation Criterion (a)		Alt. 1: Excavation and Off-Post Treatment/ Disposal (b)	Alt. 2: Excavation, Soil Washing, and Off-Post Treatment/ Disposal	Alt. 3: Excavation, Solidification/ Stabilization, and Off-Post Treatment/Disposal
Technical	Performance	High	High	Moderate
	Reliability	High	Moderate	Moderate
	Implementability	High	Moderate	Moderate
	Safety	Moderate	Moderate	Moderate
Human health assessment		High	High	High
Environmental assessment		High	High	High
Administrative feasibility		High	Moderate	Moderate
Cost		$1,400,000	$1,600,000	$1,500,000
Relevant section in Corrective Measures Study		9.2.1	9.2.2	9.2.3

(a) Rankings indicate the effectiveness of each alternative in meeting the evaluation criteria, relative to other alternatives.
(b) Recommended corrective measures alternative for SWMU 57.

For more information about SWMU 57, see pages 52 to 54, and Table 1 on page 56 in this Decision Document.

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INTRODUCTION*

This ***Decision Document*** briefly discusses the preferred ***corrective measures*** and supporting analyses for 21 areas within seven ***solid waste management units*** (SWMUs) at Tooele Army Depot (TEAD), Tooele, Utah. The seven SWMUs are listed below:

- SWMU 49 (Stormwater/Industrial Wastewater Piping).
- SWMU 50 (Compressor Condensate Drains, Buildings 613 and 619).
- SWMU 51 (Chromic Acid/Alodine Drying Beds).
- SWMU 52 (Possible Drain Field/Disposal Trenches).
- SWMU 54 (Sandblast Areas).
- SWMU 56 (Gravel Pit).
- SWMU 57 (Skeet Range).

This document is issued by the U.S. Army (the owner of TEAD), the U.S. Environmental Protection Agency (EPA), and the Utah Department of Environmental Quality (UDEQ; the State regulatory support agency for TEAD) as part of their public participation responsibilities under the ***Resource Conservation and Recovery Act*** (RCRA).

Following the review of information received during the public comment period, the Army and UDEQ will select a final corrective measure for each of the 21 areas within the seven SWMUs addressed herein. The Response to Comments and Final Decision Document and the ***RCRA Post Closure Monitoring and Corrective Action Permit*** modification will present the selected corrective measures.

The Decision Document highlights information that can be found in greater detail in the ***RCRA Facility Investigation*** (RFI) Report, the ***Corrective Measures Study*** (CMS) Work Plan, the CMS Report, and other available reports. The Army encourages the public to review and comment on these supporting documents, which are available at the following locations:

Tooele Army Depot
Public Affairs Office
T-1 Headquarters Building
Tooele Army Depot, UT 84074

Tooele Public Library
47 East Vine Street
Tooele, UT 84074

Marriott Library
University of Utah
372 S. Marriott
Salt Lake City, UT 84112

Grantsville Public Library
198 West Main Street
Grantsville, UT 84029

*Terms shown in bold italics are defined in the Word Notebook, pages 61 to 63.

PROGRAM SUMMARY

The program summary reviews historical information on TEAD and presents an overview of the RFI (including the human health ***risk assessment*** (RA) and the ***ecological RA)*** and the CMS.

FACILITY BACKGROUND

TEAD is located in Tooele Valley, Tooele County, Utah, immediately west of the City of Tooele (population 13,887 in 1990) and approximately 35 miles southwest of Salt Lake City. The installation covers 23,473 acres; 1,700 acres (from an original 25,173) were transferred in December 1998 under the ***Base Realignment and Closure*** (BRAC) program. The surrounding area is largely undeveloped, with the exception of Tooele, Grantsville (population 4,500, north of TEAD), and Stockton (population 400, south of TEAD).

Land use surrounding the Depot includes pasture, cultivation, and rangeland grazing. Figure 1 shows the location of TEAD.

TEAD was originally established as the Tooele Ordnance Depot in 1942. It was renamed the Tooele Army Depot - North Area (TEAD-N) in 1962 and given its present designation ("TEAD") in June 1996. Since 1942, TEAD was used for the maintenance and repair of Army vehicles and equipment; the storage, maintenance, and disposal of munitions; and the support of other Army installations in the western United States.

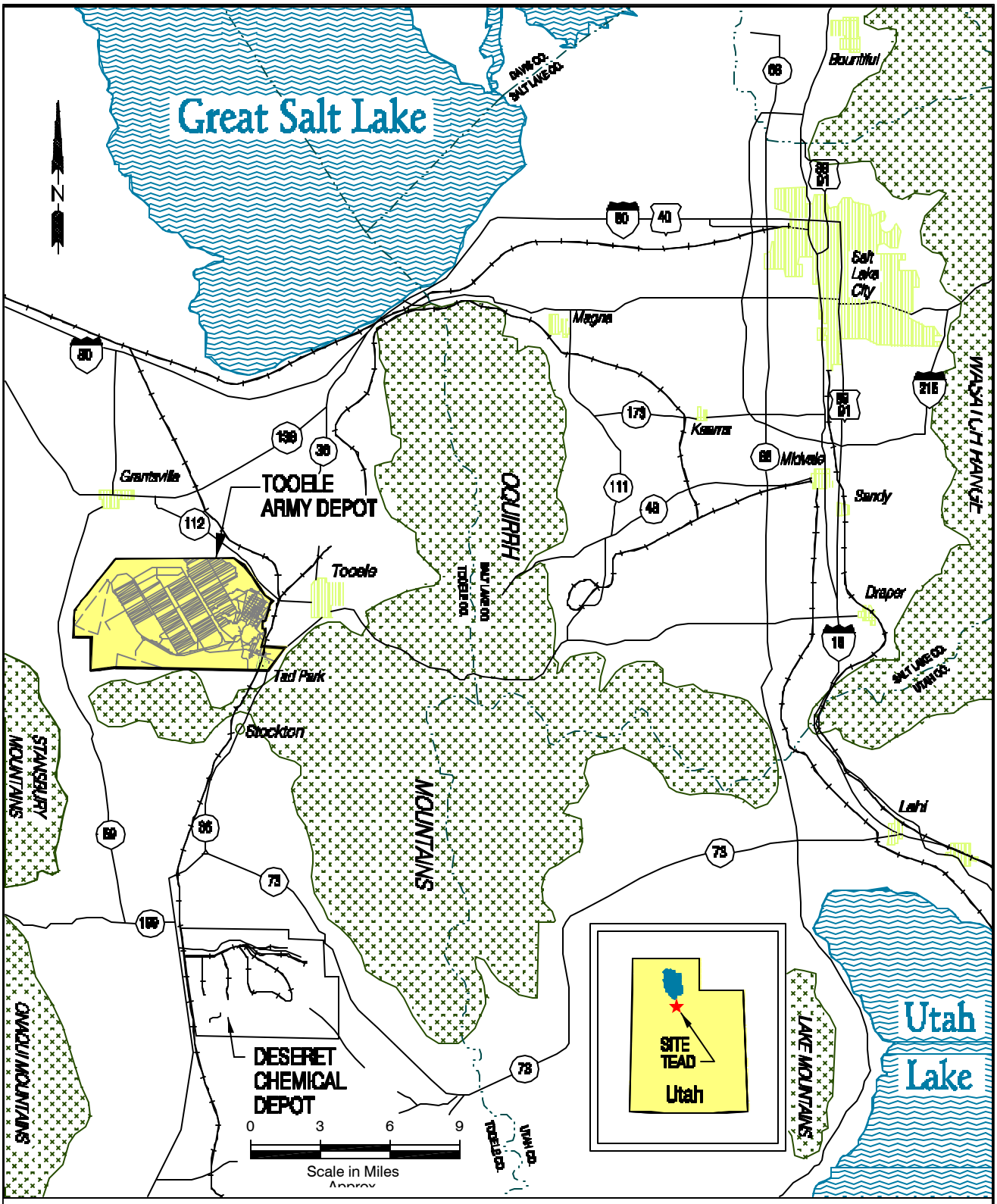
The mission of maintaining and repairing vehicles and equipment was discontinued in 1995. The remaining two missions are expected to continue for the foreseeable future. A portion of TEAD, including the Administration Area and Maintenance Area, was transferred as part of the BRAC program. This parcel will be converted from military to nonmilitary use. Two of the Group C SWMUs, SWMU 52 and SWMU 57, are located within the BRAC parcel and will be converted to residential use. The other Group C SWMUs addressed in this document are also located in the BRAC parcel, but will be converted to nonmilitary industrial use.

As a result of past operations at TEAD, a variety of known or suspected waste and spill sites have been identified. Environmental investigations from the late 1970s to the present have identified 57 locations referred to as SWMUs.

In October 1990, TEAD was placed on the ***National Priority List*** (NPL) under the ***Comprehensive Environmental Response, Compensation, and Liability Act*** (CERCLA). A ***Federal Facility Agreement*** (FFA) between the Army, EPA Region 8, and UDEQ designated 17 of the 57 SWMUs to be investigated under CERCLA. The remaining SWMUs were to be investigated under RCRA.

In January 1991, TEAD was issued a ***RCRA post-closure permit*** for the Industrial Waste Lagoon (IWL***)***, SWMU 2. The permit included a ***corrective action permit*** (CAP) that required investigation and potential cleanup at 29 SWMUs. Currently, 40 SWMUs are being addressed under the CAP. The seven Group C Suspected Releases SWMUs discussed in this Decision Document are managed under the RCRA CAP program.

Figure 2 shows the locations of SWMUs 49, 50, 51, 52, 54, 56, and 57 within TEAD.



SOURCE: RUST E&I, 1995

FIGURE 1
LOCATION MAP OF
TOOELE ARMY DEPOT
AND VICINITY

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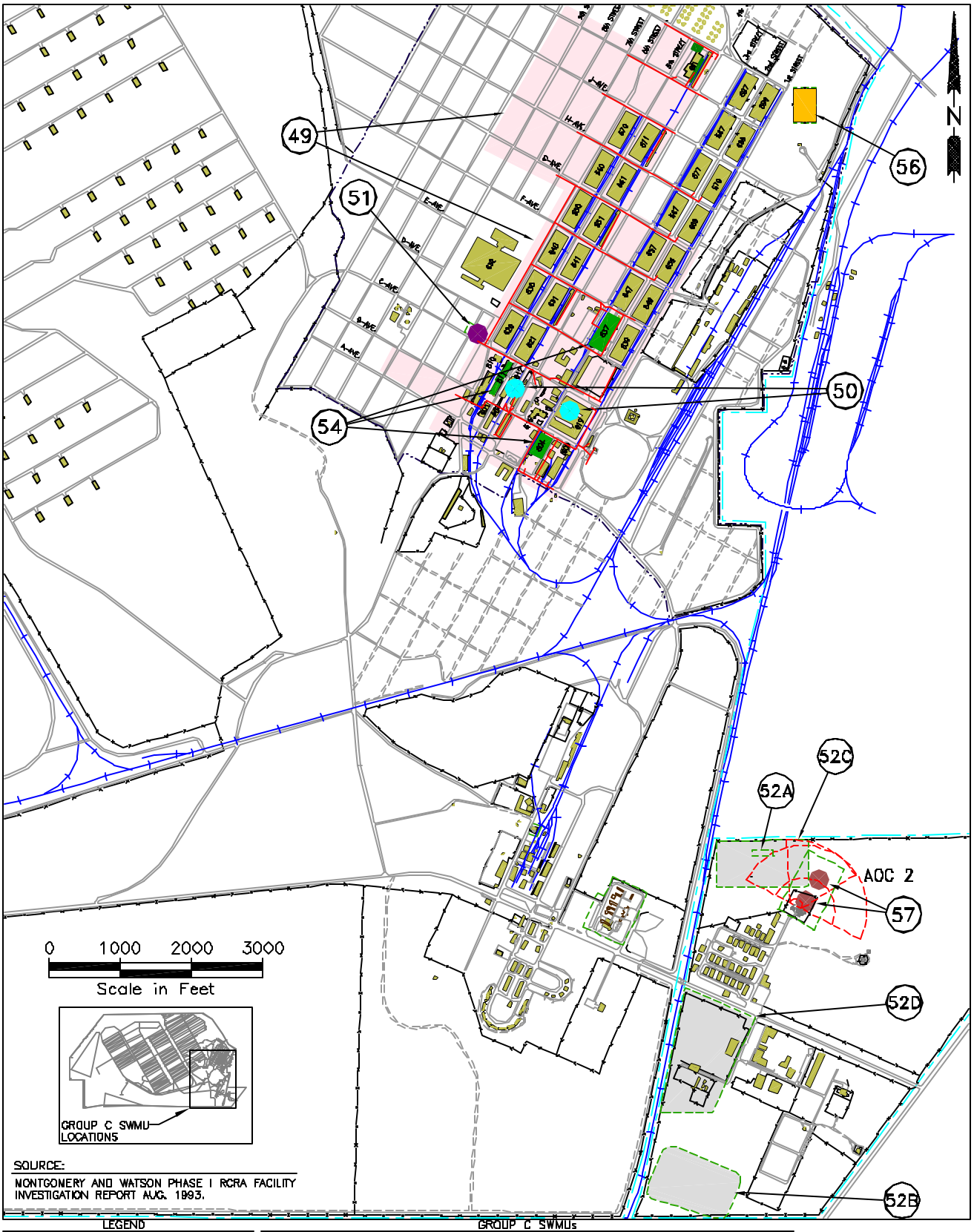

LEGEND

- BUILDING
- FENCE
- RAILROAD
- BRAC PARCEL BOUNDARY
- TEAD-N BOUNDARY
- UNDERGROUND STORMWATER PIPING

GROUP C SWMUs

- #49 STORMWATER/INDUSTRIAL WASTEWATER PIPING
- #50 COMPRESSOR CONDENSATE DRAINS
- #51 CHROMIC ACID/ALODINE DRYING BEDS
- #52 POSSIBLE DRAIN FIELD/DISPOSAL TRENCHES
- #54 SANDBLAST AREAS
- #56 GRAVEL PIT
- #57 SKEET RANGE

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FIGURE 2
LOCATION OF GROUP C SUSPECTED RELEASE SWMUs
TOOELE ARMY DEPOT

Descriptions of each SWMU are provided on pages 19 through 54.

The following sections present an overview of the RFI, including the human health RA, ecological RA, and the CMS.

RCRA FACILITY INVESTIGATION

Investigations were conducted at each of the 21 areas within the seven Group C SWMUs to evaluate the presence and extent of chemicals potentially released to the environment from past site activities. These investigations included the following:

- Collection and laboratory analysis of soil samples to assess SWMU-related contaminant concentrations.

- Comparison of these concentrations to EPA guidelines to evaluate whether they are of potential concern to human health or the environment.

- Comparison of the metals concentrations detected in site samples to ***background*** metals concentrations. (Metals are naturally occurring in soil.)

The RFI identified ***contaminants of potential concern*** (COPCs), which are those contaminants:

- Detected at levels above those found naturally in the environment.

  – or –

- Detected at levels above EPA guidelines.

The human health RA evaluated potential human health effects due to each of the COPCs. The ecological RA evaluated potential effects of site contamination on plants and animals. The next two sections describe the RAs.

Groundwater monitoring data was not collected at any of the Group C SWMUs. However a soil vadose zone transport model (SESOIL) indicated that no impacts to groundwater are expected based on contaminant concentrations in soil. Moreover, the infiltration to groundwater is extremely low due to low precipitation rates, high evaporation rates, and depth to groundwater (approximately 300 feet below ground surface (bgs) at these SWMUs).

HUMAN HEALTH RISK ASSESSMENT

In accordance with EPA and State of Utah guidance, the human health RA evaluated potential ***cancer risks*** and ***noncancer health effects*** from exposure to the identified COPCs. Risks and effects are considered for the various ***receptors*** (current Depot worker, current industrial worker, future construction worker, current offsite resident, future adult resident, and future child resident) under different ***exposure scenarios***.

Definition of Cancer Risks, Noncancer Health Effects, and Exposure Scenarios

The American Cancer Society has determined that the expected overall likelihood that an adult will develop cancer during a 70-year lifetime is one in three. The assessment of cancer risks for this program calculates the increased likelihood that an individual will develop cancer as a result of long-term site-related exposure to carcinogens over a 70-year lifetime.

According to EPA and UDEQ, a calculated cancer risk is unacceptable if the increased likelihood of getting cancer is greater than one in 10,000. Furthermore, a cancer risk of less than one in 1 million is considered to be acceptable and does not require remedial action. Sites with cancer risks between one in 10,000 and one in 1 million may require further consideration to determine whether ***corrective action*** is appropriate.

The assessment of noncancer health effects calculates the likelihood of risks other than cancer as a result of long-term exposure to contaminants. This is reported as a ***hazard index*** (HI). A calculated HI of less than 1.0 indicates that health effects expected from site-related contaminants are acceptable according to EPA and UDEQ standards.

Hazards may include individual weight gain or loss, organ weight changes, or changes in blood chemistry. They are usually determined based on data from animal laboratory studies or from human studies in the workplace. The term "hazards" is used to refer to noncancer health effects.

Blood lead levels are evaluated as a separate health effect and are treated the same as hazards. This evaluation uses an EPA model for lead uptake from the environment (including soil) into the human body. The U.S. Centers for Disease Control and Prevention (CDC) has established a target limit for lead concentration in children of 10 micrograms per deciliter (μg/dL) of blood in less than 5 percent of the model population. When extrapolated to adults, this limit is 11.1 μg/dL. EPA recommends that this model be used when lead levels in soil equal or exceed 400 micrograms per gram (μg/g) of soil.

Potential cancer risks and noncancer hazards are calculated for the following receptors:

- Current Depot worker
- Current industrial worker
- Future construction worker
- Current offsite resident
- Future adult resident
- Future child resident.

These receptors may be exposed to COPCs by a variety of pathways or exposure scenarios. Exposure scenarios can be real or hypothetical, current or future.

The hypothetical residential exposure scenario must be evaluated for all sites. This scenario calculates the risks and hazards for an adult and a child living at the identified site full time. It is assumed that the residents are exposed to surface soil through several pathways, including:

- Getting dirt on the skin and absorbing contaminants into the body through the skin (dermal absorption).

- Eating soil directly (children) or inadvertently ingesting soil because hands are unclean (children or adults; ingestion).

- Breathing in dust (inhalation).

- Eating fruits or vegetables grown in contaminated soil (produce ingestion).

- Eating beef from cattle that have grazed on grasses growing in contaminated soil (beef ingestion).

Using EPA exposure pathway guidelines and site-specific contaminant concentrations, it is possible to calculate the increased likelihood of developing cancer (from carcinogenic contaminants) or being exposed to hazards (from noncarcinogenic contaminants).

Risks and hazards are calculated for an onsite worker under the military land use exposure scenario. This calculation assumes that exposure may occur through ingestion, inhalation, or dermal absorption of surface soil during normal work hours. The worker is not assumed to eat food produced at the site. Also, for purposes of calculating risk, the worker is at the site fewer hours per day, fewer days per year, and fewer years than the resident. These assumptions are based on EPA guidelines and on reasonable information about TEAD workers.

If a SWMU is in the BRAC parcel, the future worker at the site is an industrial worker, not military. EPA provides guidelines for exposure to surface soil (e.g., a 5-day workweek) that differ somewhat from those for a Depot worker, who works 4 days a week. As before, exposure through ingestion, inhalation, and dermal absorption of surface soil is used in the calculation of industrial risks.

A construction worker at any SWMU may encounter subsurface contaminated soil during utility installation, utility maintenance, or construction. This worker may be exposed via ingestion, dermal absorption, or inhalation; however, he or she is not exposed to contaminants in food potentially produced at the site. The construction worker exposure is generally more intense (i.e., inhalation and ingestion rates of soil are higher than for the other exposure scenarios), but of a much shorter duration – which results in comparatively lower relative risks. EPA guidelines are used in calculating the associated cancer risks and hazards for the construction worker.

Regulatory Requirements

The RFI calculated cancer risks and hazards due to COPCs for the following exposure scenarios:

- Actual current and continued military
- Future construction
- Future industrial (BRAC parcel)
- Future residential adults and children.

The State of Utah Administrative Code (UAC) 315-101, "Cleanup Action and Risk-Based Closure Standards," also referred to as the "***Risk Rule***," is used to help determine what kind of corrective measures may be required.

The first part of the Risk Rule requires that the human health RA consider the residential exposure scenario for each SWMU. It also specifies the applicable exposure pathways for this scenario. Although residential use is hypothetical, it is evaluated as the scenario most protective of human health. The Risk Rule considers calculated risk for this scenario to be unacceptable if the increased likelihood of

getting cancer is greater than one in 1 million above the expected rate, if the HI is greater than 1.0, or if the modeled blood lead level is greater than the CDC limit of 10 μg/dL.

If there are no unacceptable risks or hazards under the residential scenario and all other applicable regulatory requirements are met, the site can be closed with no further action. However, corrective measures must be evaluated if the residential scenario presents unacceptable risks or hazards.

The extent of corrective measures required is then determined by considering the actual, ***reasonably anticipated future land use*** (i.e., industrial use at all sites except SWMUs 52 and 57, which are residential). The Risk Rule considers calculated risk for reasonably anticipated future land use scenarios to be unacceptable if the increased likelihood of getting cancer is greater than one in 10,000 above the expected rate, if the HI is greater than 1.0, or if the estimated blood lead level is greater than the CDC limit of 10 μg/dL.

For those sites with unacceptable risks, hazards, or blood lead levels for the reasonably anticipated future land use scenario, corrective action (e.g., excavation or treatment) is evaluated. However, if the calculated risks or health effects are acceptable and all other regulatory requirements are met, only ***management measures*** (e.g., land use or ***deed restrictions***) are required.

Potential impacts to groundwater are also considered. UAC R315-101-3, the "Principle of Non-Degradation," states that active corrective measures are required to prevent further degradation of a resource, including groundwater. In addition, the results of the ecological RA and the extent and concentrations of contaminants are reviewed in selecting the most appropriate corrective measure.

A site that is determined to present an unacceptable risk or hazard for the reasonably anticipated future land use scenario is corrected to standards developed for that scenario. These standards are less stringent for military, industrial, or construction use than for residential use. Thus, in these three circumstances, contaminants may remain onsite at concentrations that – though lowered – may still present risks to the hypothetical future residential receptor. These ***residual risks*** are not addressed unless the land use changes (e.g., if one of the SWMUs slated for industrial use becomes residential). If this occurs, the risks and corrective measures must be reevaluated.

Results

As discussed above, the human health RA considered the residential exposure scenario for all 21 areas within SWMUs 49, 50, 51, 52, 54, 56, and 57. The RA identified potential risks, hazards, or blood lead levels above those allowed under the residential scenario at each of these areas except SWMU 52A, which is not included in the CMS. At Building 609 of SWMU 49 and Building 604 of SWMU 54, the residential risks and hazards come from metals present in soil at levels below comprehensive basewide background levels. Because metals at these levels are naturally derived, they do not require cleanup.

To determine the extent of corrective measures required, the RA subsequently evaluated the realistic future land use exposure scenario.

Under the realistic future land use exposure scenario, cancer risks greater than one in 10,000 were identified at the following areas:

- *Skeet Range (SWMU 57).*

Under the realistic future land use exposure scenarios, an HI above 1 was identified at the following areas:

- *Disposal Trenches (SWMU 52B)*
- *Charcoal Material Area (SWMU 52C)*
- *Burned Area at the Gravel Pit (SWMU 56)*
- *Skeet Range (SWMU 57).*

Under the realistic future land use exposure scenarios, 95th percentile blood lead levels above the CDC target of 10 µg/dL were identified at the following areas:

- *Building 611 at the Sandblast Areas (SWMU 54)*
- *Burned Area at the Gravel Pit (SWMU 56)*
- *Skeet Range (SWMU 57).*

Based on these results from the human health RA, corrective actions are evaluated for SWMUs 52C, 54 (Building 611), 56, and 57. Management measures – at a minimum – are required at the remaining SWMUs. Corrective actions are not considered for SWMU 52B because the HI above 1 is due to thallium detections at 10 feet below ground surface so deed restrictions will prevent exposure. Additional factors, including regulatory requirements (see pages 14 and 15), may require corrective action beyond management measures.

ECOLOGICAL RA

The ecological RA evaluated the potential effects of identified COPCs on plants and animals at the seven Group C SWMUs – focusing on the areas and receptors most at risk. The following steps are included in the RA process:

- Site characterization – which includes surveying site soil, plant life, and animal life.
- Identification of ecological COPCs and their concentrations and toxicity.
- Selection of ecological receptors – the species of plants and animals observed or potentially present at the SWMUs.
- Calculation of ecological risk based on available habitat, COPCs, and ecological receptors.

Potentially significant adverse impacts to ecological receptors were identified at the Skeet Range (SWMU 57).

Based on these results from the ecological RA, corrective measures are required to protect plants and animals at SWMU 57 only.

The Phase II RFI identified moderate ecological risks at SWMU 51, SWMU 56, and the SWMU 49 B, G, J, and K Avenue Outfalls. However, the moderate risks to plants at these sites are highly uncertain due to limited toxicological information. In addition, the Site Wide Ecological Risk Assessment concluded that only SWMU 56 had adequate ecological habitat. Therefore, no corrective measures are recommended to mitigate ecological risks at these sites. The ecological risks at SWMU 50, 52, 54, and the remaining SWMU 49 areas were evaluated as low and also do not warrant corrective measures.

CORRECTIVE MEASURES STUDY

According to the Risk Rule, each of the seven Group C SWMUs presents unacceptable risks and hazards under the hypothetical future residential land use scenario. Four SWMUs present unacceptable health effects for the reasonably anticipated future land use (i.e., residential or military/industrial).

The CMS evaluates corrective measures that are protective of both human health and the environment, and that comply with Federal, State, and local requirements. The CMS process includes:

- Development of ***corrective action objectives*** (CAOs), which are chemical-specific concentrations for each land use scenario.
- Comparison of the maximum concentrations of COPCs (i.e., chemicals detected at levels exceeding EPA guidelines, as identified in the RFI Report) to CAOs for the reasonably anticipated land use.
- Comparison of the ***exposure point concentration*** (EPC) for each COC to its CAO as needed.
- Identification of potentially applicable corrective action alternatives.
- Evaluation and comparison of these alternatives.
- Recommendation of the most appropriate alternative for each SWMU.

Corrective Action Objectives

CAOs are used to focus the development of corrective action alternatives on technologies that are likely to achieve the desired target levels. The primary qualitative CAO is to protect human health and the environment. The corrective measure must meet the intent of Federal, State, and local regulations – in this case, the State of Utah Risk Rule (UAC R315-101, including its "Principle of Non-Degradation"), Utah's Solid Waste Facility Location Standards, Interim Status Requirements for Hazardous Waste Facilities (UAC R315-7), and TEAD's Part B permit.

CAOs may also be quantitative – i.e., target cleanup concentrations for contaminants; they vary for each land use scenario because of the different receptors and exposure pathways.

Identification of Contaminants of Concern

COPCs that exceed CAOs are site-related chemicals that are determined to be responsible for elevated risks under the reasonably anticipated future land use scenario. They are referred to as ***contaminants of concern*** (COCs).

The CAO for chemicals that may cause cancer is the concentration of each compound that results in a potential calculated risk of one in 1 million – which, for industrial/military CAOs, is much stricter than the Risk Rule's acceptable value of one in 10,000. Therefore, in some cases, industrial COCs were identified even though the calculated risk is less than one in 10,000. CAOs are consistent with EPA's acceptable risk range as defined in the National Contingency Plan. The CAO for noncancer-causing chemicals is the concentration of each compound that results in an HI of 1.0. This is equivalent to the Risk Rule's standard. A lead concentration of 1,800 µg/g is equivalent to a blood lead level of 10 µg/dL.

The COCs are then evaluated in conjunction with results of the RA to determine what level of corrective measures must be evaluated. The EPC for each COC is compared to its CAO. If the EPC for a compound is less than its CAO,

the maximum concentration of that chemical does not pose a human health risk.

Under the reasonably anticipated future land use, no COCs were identified at the following areas (i.e., levels of contaminants onsite are below CAOs for that land use):

- SWMU 49
  - Sewer Line – Northern Area
  - Building 609
  - B Avenue Outfall
  - H Avenue Outfall
  - J Avenue Outfall
  - K Avenue Outfall.
- SWMU 50
  - Building 613.
- SWMU 52B (disposal trenches).
- SWMU 54
  - Building 604.
- SWMU 56.

However, COCs were identified in soil at the following SWMUs, as noted below:

- Metals at SWMU 49, Sewer Line – Southern Area.
- ***Semivolatile organic compounds*** (SVOCs) at SWMU 49, Sewer Line – Central Area.
- SVOCs at SWMU 49, G Avenue Outfall.
- Metals at SWMU 50, Building 619.
- SVOCs at SWMU 51.
- SVOCs at SWMU 52C.
- Pesticides at SWMU 52D.
- Metals at SWMU 54, Building 611.
- SVOCs at SWMU 54, Building 637.
- Metals and SVOCs at SWMU 57.

Following Utah and EPA guidance, these COCs were evaluated for distribution and concentration.

In accordance with regulatory guidance, the following sites received an evaluation of active corrective measures:

- *SWMU 49, Southern Area*
  - *Lead in soil.*
- *SWMU 49, Central Area*
  - *Benzo(a)anthracene and benzo(a)pyrene in soil.*
- *SWMU 49, G Avenue Outfall*
  - *Benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene in soil.*
- *SWMU 50, Building 619*
  - *Arsenic in soil.*
- *SWMU 52C*
  - *Benzo(a)anthracene in soil.*
- *SWMU 52D*
  - *Chlordane in soil.*
- *SWMU 54, Building 611*
  - *Cadmium and lead in soil.*
- *SWMU 57*
  - Metals and SVOCs in soil.

SWMU 51 and SWMU 54 (Building 637) have COCs but do not receive an evaluation of active corrective measures because the COCs were only detected once or twice slightly above CAO levels and the human health RA did not identify potential risks, hazards, or blood levels for the realistic future land use.

SWMU 56 does not have any COCs for its realistic future land use, but the human health RA identified an unacceptable hazard. Therefore, active corrective measures are also considered at SWMU 56.

Management measures are evaluated for all other SWMUs.

Identification and Evaluation of Alternatives

The CMS identifies alternatives for each SWMU that meet the CAOs and are protective of human health and the environment. Each alternative consists of technologies or management measures that address the ***media*** of concern (e.g., groundwater, soil) and the COCs. More than one alternative may be identified for a particular area.

Alternatives are evaluated and compared for each SWMU to determine which alternative best meets the following criteria:

- **Technical criteria**

  – Performance – evaluates whether the corrective measures alternative can perform its intended function and meet the CAOs, including compliance with Federal, State, and local regulations. This criterion considers site and waste characteristics, and addresses the useful life of each alternative (i.e., the length of time the alternative maintains its intended level of effectiveness).

  – Reliability – describes the long-term effectiveness and permanence of each alternative. This criterion evaluates the adequacy of the corrective measures alternative based on performance at similar sites, ***operation and maintenance*** (O&M) requirements, long-term environmental monitoring needs, and residuals management measures.

  – Implementability – assesses the technical and institutional feasibility of executing a corrective measures alternative, including constructability, permit and legal/regulatory requirements, availability of materials, etc. This criterion also addresses the length of time from implementation of the alternative until beneficial effects are realized.

  – Safety – considers the potential threats to workers, nearby communities, and the environment during implementation of the corrective measure.

- **Human health assessment** – evaluates the extent to which each alternative protects human health. This criterion considers the classes and concentrations of contaminants left onsite, potential exposure routes, and potentially affected populations. Residual contaminant concentrations are also compared to existing criteria, standards, or guidelines.

- **Environmental assessment** – evaluates short-and long-term effects of the corrective measure on the environment, including adverse impacts to environmentally sensitive areas.

- **Administrative feasibility** – considers compliance with applicable Federal, State, and local environmental and public health standards, requirements, criteria, or limitations.

- **Cost** – presents ***capital cost*** and annual O&M cost for each corrective measures alternative. Capital costs include direct and indirect costs. Annual costs typically include labor, maintenance, energy, and sampling/ analysis. For purposes of comparison, costs are presented in terms of ***present worth***, which is the current value of a future expenditure. The cost estimates are based on conventional cost estimating guides, vendor information, and engineering judgment.

Recommended Alternatives

For each SWMU, the alternative that best protects human health and the environment, has proven reliable at other sites, and meets regulations is recommended to the public and UDEQ.

The next section presents a detailed evaluation of alternatives.

The recommended corrective measures alternatives for the seven Group C SWMUs are noted below:

- SWMU 49 (Stormwater/Industrial Wastewater Piping)
  - Sewer Line – Southern Area
    Deed restrictions to prevent residential use of the site.
  - Sewer Line – Central Area
    Deed restrictions to prevent residential use of the site.
  - Sewer Line – Northern Area
    Deed restrictions to prevent residential use of the site.
  - Building 609
    No action.
  - B Avenue Outfall
    Deed restrictions to prevent residential use of the site.
  - G Avenue Outfall
    Excavation, off-post treatment/disposal, and deed restrictions to prevent residential use of the site.
  - H Avenue Outfall
    Deed restrictions to prevent residential use of the site.
  - J Avenue Outfall
    Deed restrictions to prevent residential use of the site.
  - K Avenue Outfall
    Deed restrictions to prevent residential use of the site.
- SWMU 50 (Compressor Condensate Drains, Buildings 613 and 619)
  - Building 613 Drain
    Deed restrictions to prevent residential use of the site.
  - Building 619 Drain
    Deed restrictions to prevent residential use of the site.
- SWMU 51 (Chromic Acid/Alodine Drying Beds)
  - Deed restrictions to prevent residential use of the site.
- SWMU 52 (Possible Drain Field/Disposal Trenches)
  - 52B Disposal Trenches
    Deed restrictions to limit residential use of the site.
  - 52C Charcoal Material Area
    Excavation and off-post treatment/ disposal.
  - 52D Horse Stable Area
    Excavation and off-post treatment/ disposal.
- SWMU 54 (Sandblast Areas)
  - Building 604
    No action.

- Building 611
  Excavation, off-post treatment/disposal, and deed restrictions to prevent residential use of the site.

- Building 637
  Deed restrictions to prevent residential use of the site.

- SWMU 56 (Gravel Pit)

  - Excavation and off-post treatment/ disposal.

- SWMU 57 (Skeet Range)

  - Excavation and off-post treatment/ disposal.

SWMU SUMMARIES

The SWMU summaries present background information and results of the RFI, human health and ecological RAs, and CMS for SWMUs 49, 50, 51, 52, 54, 56, and 57.

SWMU 49 (STORMWATER/INDUSTRIAL WASTEWATER PIPING)

Site Background – SWMU 49 is located in an area of the BRAC parcel designated for future industrial use in accordance with the TEAD Conversion and Reuse Plan. This SWMU consists of the existing stormwater system piping and outfalls located throughout the 1,179-acre Maintenance Area of TEAD. It also includes Building 609, a former Steam Cleaning/Radiator Repair Facility located in the southeast section of the Maintenance Area. Large amounts of wastewater were produced at this facility during previous operations, which may have affected the stormwater/industrial wastewater system.

The stormwater system includes approximately 15,000 feet of interconnected pipes and also manholes, drain systems, and culverts. The main arteries run east-west and are located beneath the lettered streets (A through L Avenues). Secondary pipes run perpendicular to the main arteries and interconnect at road intersections throughout the Maintenance Area. Stormwater is discharged to the ground surface north of the Maintenance Area and dissipates through evaporation and infiltration.

From the late 1940s until 1988, when a new industrial wastewater system was installed, SWMU 49 piping carried industrial wastewater effluent to the discharge area north of the Maintenance Area. Several buildings may have released potentially hazardous wastes to the stormwater system. The buildings in this area were primarily used for vehicle maintenance (including reassembly and repair, machining, refurbishing of fuel tanks and radiators, metal degreasing, sandblasting, painting, and forming and shaping of sheet metal). Up to 120,000 gallons of potentially contaminated industrial wastewater was discharged each day and may have contained contaminants such as acids, caustics, solvents, detergents, oil and grease, and heavy metals. All activities associated with vehicle maintenance have ceased. All known floor drains and pipes have reportedly been sealed and no longer discharge wastes to the stormwater system.

Because of the large area occupied by the stormwater/industrial wastewater piping, SWMU 49 was evaluated as nine separate areas during the Phase II RFI, as listed below:

- Sewer Line – Southern Area
- Sewer Line – Central Area
- Sewer Line – Northern Area
- Building 609
- B Avenue Outfall
- G Avenue Outfall
- H Avenue Outfall
- J Avenue Outfall
- K Avenue Outfall.

Sewer Line – Southern Area

Summary of RFI – In subsurface soil, metals and SVOCs were identified as COPCs. Surface soil was not analyzed at this area because the piping system is underground.

Summary of RAs – The human health RA identified elevated HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for future construction workers. In addition, risks and hazards were not calculated

for actual current (and realistic future) industrial workers because these receptors are exposed to surface soil only, and surface soil was not analyzed at this area.

No ecological RA was performed for the Sewer Line – Southern Area of SWMU 49 because surface soil was not analyzed at this area.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs were not calculated for actual current (and realistic future) industrial workers because these workers are expected to be exposed to surface soil only, and surface soil was not analyzed at this area. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternatives – Lead was identified as a COC in subsurface soil at the Sewer Line – Southern Area. However, lead was detected above its CAO in one subsurface soil sample only, and the EPC for lead in subsurface soil is well below the EPA screening level. Therefore, also considering the results of the human health RA, two corrective measures alternatives were considered, as described below.

Alternative 1 – Deed Restrictions

This alternative is the application of deed restrictions to prevent future residential development of this area. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Deed restrictions on the BRAC property are governed by the ***Covenants, Conditions, and Restrictions*** (CCRs). In addition to the existing CCRs, a site management plan will be delivered upon acceptance of the Decision Document. In this plan, the area subject to deed restrictions is surveyed and legally defined. This plan also describes the restrictions that apply to the SWMU and periodic inspections and monitoring to ensure the deed restrictions are being observed. The site management plan will become part of TEAD's RCRA Corrective Action and Post Closure Monitoring Permit. In addition, the RCRA Post Closure Permit shall be reviewed every 5 years.

Alternative 2 – Excavation, Off-Post Treatment/ Disposal, and Deed Restrictions

This corrective measures alternative includes excavation of an estimated 33 cubic yards (yd^3) of contaminated soil to a depth of approximately 9 feet using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until the concentration of lead is detected below its industrial use CAO.

If the soil is classified as hazardous based on the results of a soil profile analysis (including total waste and toxicity characteristic leaching procedure (TCLP) analysis), the excavated soil is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a treatment, storage, and disposal facility (TSDF) for treatment prior to disposal. It is assumed that the contaminated soil is sent to a TSDF for pretreatment to comply with applicable RCRA land disposal restrictions (LDRs). However, if the soil results are acceptable, the soil may be sent to a Subtitle D landfill.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and covered with gravel or asphalt.

Deed restrictions (described in Alternative 1) to prevent future residential use of the site are also included as part of this alternative.

Evaluation of Alternatives – The proposed corrective measures alternatives for the Sewer Line – Southern Area at SWMU 49 are evaluated and compared below:

- Technical criteria
  - Performance – Both Alternative 1 (deed restrictions) and Alternative 2 (excavation, off-post treatment/disposal, and deed restrictions) are rated high with respect to performance. Both Alternatives meet the CAOs.
  - Reliability – Alternatives 1 and 2 are rated high for reliability. Each alternative has been proven effective at other sites and does not require onsite O&M activities – though O&M and long-term monitoring are required at the off-post landfills.
  - Implementability – Alternative 1 is easy to implement and is rated high. Alternative 2 is rated moderate because although equipment and contractors for excavation and removal are readily available, the presence of the sewer line will hamper excavation activities. Shoring of the excavation will also be necessary.
  - Safety – Alternative 1 is rated high because no intrusive activities are required. Alternative 2 is rated moderate because it requires handling of contaminated soil and transporting the soil offsite for treatment/disposal. It presents short-term exposure to both onsite workers and offsite residential communities.
  - Human health assessment – Both Alternatives 1 and 2 are rated high because they protect human health by preventing residential exposure to the identified contaminants. Alternative 2 also removes soil with lead above its CAO. However, the EPC for lead is well below its CAO and so Alternative 1 is also protective of industrial and construction receptors. In addition, the COC is 7 feet bgs so exposure will only occur if the subsurface soil is excavated.
  - Environmental assessment – Both alternatives are rated high because they have no effects on the ecological environment surrounding the Sewer Line – Southern Area.
  - Administrative feasibility – Both Alternatives 1 and 2 are rated high. Both alternatives meet the requirements of UAC R315-101 but require deed restrictions.
  - Cost – Of the two alternatives, Alternative 1 is the least costly – with an estimated total present worth cost of $12,000. The cost for Alternative 2 is estimated at $47,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use (Alternative 1) is the recommended alternative for the Sewer Line – Southern Area at SWMU 49.

Sewer Line – Central Area

Summary of RFI – In subsurface soil, metals and SVOCs were identified as COPCs. Surface soil was not analyzed at this area because the piping system is underground.

Summary of RAs – The human health RA identified elevated cancer risks for onsite adult and child residents. No elevated cancer risks or HIs were identified for future construction

workers. In addition, risks and hazards were not calculated for actual current (and realistic future) industrial workers because these receptors are exposed to surface soil only, and surface soil was not analyzed at this area.

No ecological RA was performed for the Sewer Line – Central Area of SWMU 49 because surface soil was not analyzed at this area.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs were not calculated for actual current (and realistic future) industrial workers because these workers are expected to be exposed to surface soil only, and surface soil was not analyzed at this area. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternatives – Two SVOCs were identified as COCs in subsurface soil at the Sewer Line – Central Area. However, both were detected at maximum concentrations only slightly above corresponding CAOs and at two locations only. The EPCs for both SVOCs are below their CAOs. Therefore, also considering the results of the human health RA, two corrective measures alternatives were considered, as described below.

Alternative 1 – Deed Restrictions

This alternative is the application of deed restrictions to prevent future residential development of this area. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented under Alternative 1 for the Sewer Line – Southern Area.

Alternative 2 – Excavation, Off-Post Treatment/ Disposal, and Deed Restrictions

This corrective measures alternative includes excavation of an estimated 63 yd^3 of contaminated soil from two locations at depths of approximately 6 feet and 11 feet using an excavator, back-hoe, or similar equipment. Excavation and con-firmatory sampling continue until the concentrations of benzo(a)anthracene and benzo(a)pyrene are detected below industrial use CAOs.

If the soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), the excavated soil is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. However, if the soil is not hazardous, it may be sent to a Subtitle D landfill. It is assumed that the contaminated soil is not hazardous based on a preliminary review of the site contamination.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and covered with gravel or asphalt.

Deed restrictions (described in Alternative 1) to prevent future residential use of the site are also included as part of this alternative.

Evaluation of Alternatives – The proposed corrective measures alternatives for the Sewer Line – Central Area at SWMU 49 are evaluated and compared below:

- Technical criteria
  - Performance – Both Alternative 1 (deed restrictions) and Alternative 2 (excavation, off-post treatment/disposal, and deed restrictions) are rated high

with respect to performance. Both Alternatives meet the CAOs.

- Reliability – Alternatives 1 and 2 are rated high for reliability. Each alternative has been proven effective at other sites and does not require onsite O&M activities – though O&M and long-term monitoring are required at the off-post landfills.

- Implementability – Alternative 1 is easy to implement, and is rated high. Alternative 2 is rated moderate because although equipment and contractors for excavation and removal are readily available, the presence of the sewer line will hamper excavation activities. Shoring of the excavation will also be necessary.

- Safety – Alternative 1 is rated high because no intrusive activities are required. Alternative 2 is rated moderate because it requires handling of contaminated soil and transporting the soil offsite for treatment/disposal. It presents short-term exposure to both onsite workers and offsite residential communities.

- Human health assessment – Both Alternatives 1 and 2 are rated high because they protect human health by preventing residential exposure to the identified contaminants. Alternative 2 also removes soil with SVOCs above their CAOs. However, the EPCs for the SVOCs are below their CAOs and so Alternative 1 is also protective of industrial and construction receptors. In addition, the COCs are 5 and 11 feet bgs so exposure will only occur if the subsurface soil is excavated.

- Environmental assessment – Both alternatives are rated high because they have no effects on the ecological environment surrounding the Sewer Line – Central Area.

- Administrative feasibility – Both Alternatives 1 and 2 are rated high. Both alternatives meet the requirements of UAC R315-101 but require deed restrictions.

- Cost – Of the two alternatives, Alternative 1 is the least costly – with an estimated total present worth cost of $12,000. The cost for Alternative 2 is estimated at $52,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use (Alternative 1) is the recommended alternative for the Sewer Line – Central Area at SWMU 49.

Sewer Line – Northern Area

Summary of RFI – In subsurface soil, metals and SVOCs were identified as COPCs. Surface soil was not analyzed at this area because the piping system is underground.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for future construction workers. In addition, risks and hazards were not calculated for actual current (and realistic future) industrial workers because these receptors are exposed to surface soil only, and surface soil was not analyzed at this area.

No ecological RA was performed for the Sewer Line – Northern Area of SWMU 49 because surface soil was not analyzed at this area.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs were not calculated for actual current (and realistic future) industrial workers because these workers are expected to be exposed to surface soil only, and surface soil was not analyzed at this area. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – No COCs were identified at the Sewer Line – Northern Area. Therefore, also considering the results of the human health RA, only one management measures alternative – deed restrictions to prevent future residential development of this area – was considered. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Addition information concerning deed restrictions is presented under Alternative 1 for the Sewer Line – Southern Area.

Evaluation of Alternative – The application of deed restrictions at the Sewer Line – Northern Area at SWMU 49 meets the evaluation criteria, as detailed below:

- Technical criteria
  - Performance – Deed restrictions limit future exposure by preventing residential use of the Sewer Line – Northern Area at SWMU 49 and thus meet the CAOs. Deed restrictions are applicable to both site and contaminant characteristics, and meet the identified goals with no decrease in effectiveness over time.
  - Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.
  - Implementability – Because SWMU 49 is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.
  - Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.
- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in subsurface soil.
- Environmental assessment – The deed restrictions alternative has no effects on the ecological environment surrounding the site.
- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing future residential development at this site.
- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use is the recommended alternative for the Sewer Line – Northern Area at SWMU 49.

Building 609

Summary of RFI – Metals and ***volatile organic compounds*** (VOCs) were identified as COPCs, in surface soil, and SVOCs were identified as COPCs in subsurface soil.

Summary of RAs – The human health RA identified elevated HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers.

No ecological RA was performed for Building 609 of SWMU 49 because suitable ecological habitat does not exist.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs for actual current (and realistic future) industrial workers are below target values. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – No COCs were identified at Building 609 at SWMU 49. A review of the human health RA conducted in the RFI indicates that thallium drives a noncancer residential health risk via the food ingestion pathway. Thallium was detected in one surface sample at a concentration of 22.6 µg/g, which is below the comprehensive basewide background level of 54 µg/g. Therefore, no corrective measures are recommended for this site.

B Avenue Outfall

Summary of RFI – In surface soil, metals and SVOCs were identified as COPCs. No COPCs were identified in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers. In addition, the projected blood lead level for child residents is greater than the CDC target of 10 µg/dL. All other blood lead levels are below the target value.

The sitewide ecological RA classified the B Avenue Outfall as presenting a moderate but not unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs for actual current (and realistic future) industrial workers are below target values. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – No COCs were identified at the B Avenue Outfall. Therefore, also considering the results of the human health RA, only one management measures alternative – deed restrictions to prevent future residential development of this area – was considered. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented under Alternative 1 for the Sewer Line – Southern Area.

Evaluation of Alternative – The application of deed restrictions at the B Avenue Outfall at SWMU 49 meets the evaluation criteria, as detailed below:

- <u>Technical criteria</u>

- Performance – Deed restrictions limit future exposure by preventing residential use of the B Avenue Outfall at SWMU 49 and thus meet the CAOs. Deed restrictions are applicable to both site and contaminant characteristics, and meet the identified goals with no decrease in effectiveness over time.

- Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.

- Implementability – Because SWMU 49 is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.

- Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.

- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil.

- Environmental assessment – The deed restrictions alternative has no effects on the ecological environment surrounding the site.
- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing future residential development at this site.

- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use is the recommended alternative for the B Avenue Outfall at SWMU 49.

G Avenue Outfall

Summary of RFI – In surface soil, metals and SVOCs were identified as COPCs. No COPCs were identified in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers.

The sitewide ecological RA classified the G Avenue Outfall as presenting a moderate but not unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated.

Identification of Corrective Measures Alternative – Three SVOCs were identified as COCs in surface soil at the G Avenue Outfall. The EPCs for each of the three ***polycyclic aromatic hydrocarbons*** (PAHs) exceed their respective CAOs, but are below concentrations corresponding to the 1×10^{-4} Utah "Risk Rule" level. The PAHs exceed CAO levels in 5 out of 6 soil samples along the outfall. For these reasons, it is recommended that corrective actions be considered for this area of SWMU 49.

Based on the evaluation of risks and the small volume of contaminated soil, only two corrective measures alternatives were considered, as described below.

Alternative 1 – Deed Restrictions

This alternative is the application of deed restrictions to prevent future residential development of this area. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented under Alternative 1 for the Sewer Line – Southern Area.

Alternative 2 – Excavation, Off-Post Treatment/ Disposal, and Deed Restrictions

Excavation, off-post treatment/disposal, and deed restrictions includes excavation of an estimated 135 yd^3 of contaminated soil to a depth of 1 foot using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until the PAHs are detected at concentrations below industrial use CAOs.

If the soil is classified as hazardous based on the results of a soil profile analysis (including TCLP analysis), the excavated soil is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal.

However, if the soil is not hazardous, it may be sent to a Subtitle D landfill or a local asphalt batching plant. It is assumed that the contaminated soil is nonhazardous based on a preliminary review of the site contamination. The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded to preexisting outfall conditions.

Deed restrictions to prevent future residential use of the site are also part of this alternative. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented under Alternative 1 for the Sewer Line – Southern Area.

Evaluation of Alternative – The proposed corrective measures alternatives for the G Avenue Outfall of SWMU 49 are evaluated and compared below:

- Technical criteria
  - Performance – Both Alternative 1 (deed restrictions) and Alternative 2 (excavation, off-post treatment/disposal, and deed restrictions) are rated high with respect to performance. Both alternatives meet the CAOs.
  - Reliability – Alternatives 1 and 2 are rated high for reliability. Each alternative has been proven effective at other sites and does not require onsite O&M activities – though O&M and long-term monitoring are required at the off-post landfills.
  - Implementability – Both alternatives are easy to implement, and are rated high. Equipment and contractors for excavation and removal are readily available.
  - Safety – Alternative 1 is rated high because no intrusive activities are required. Alternative 2 is rated moderate because it requires handling of contaminated soil and transporting the soil offsite for treatment/disposal. It presents short-term exposure to both

onsite workers and offsite residential communities.

- Human health assessment – Alternative 2 is rated high because it protects human health by preventing exposure to the identified contaminants through soil removal and deed restrictions. Alternative 1 is rated moderate because deed restrictions prevent residential use but industrial workers are exposed to SVOC contamination.

- Environmental assessment – Alternative 2 is rated high because it reduces the ecological risk by removal of contaminated soil. Alternative 1 is rated moderate because although it does not affect the ecological risk, the risk was identified as moderate but not unacceptable.

- Administrative feasibility – Both Alternatives 1 and 2 are rated high. Both alternatives meet the requirements of UAC R315-101 but require deed restrictions.

- Cost – Of the two alternatives, Alternative 1 is the least costly – with an estimated total present worth cost of $12,000. The cost for Alternative 2 is estimated at $73,000.

Recommended Alternative – Excavation, off-post treatment/disposal, and deed restrictions (Alternative 2) is the recommended alternative for the G Avenue Outfall at SWMU 49.

H Avenue Outfall

Summary of RFI – In surface soil, metals and SVOCs were identified as COPCs. No COPCs were identified in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers.

The sitewide ecological RA classified the H Avenue Outfall as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs for actual current (and realistic future) industrial workers are below target values. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – No COCs were identified at the H Avenue Outfall. Therefore, also considering the results of the human health RA, only one management measures alternative – deed restrictions to prevent future residential development of this area – was considered. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented under Alternative 1 for the Sewer Line – Southern Area.

Evaluation of Alternative – The application of deed restrictions at the H Avenue Outfall at SWMU 49 meets the evaluation criteria, as detailed below:

- Technical criteria

  – Performance – Deed restrictions limit future exposure by preventing residential use of the H Avenue Outfall at SWMU 49 and thus meet the CAOs. Deed restrictions are applicable to both site and contaminant characteristics, and meet the identified goals with no decrease in effectiveness over time.

- Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.

- Implementability – Because SWMU 49 is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.

- Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.

- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil.

- Environmental assessment – The deed restrictions alternative has no effects on the ecological environment surrounding the site.

- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing future residential development at this site.

- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use is the recommended alternative for the H Avenue Outfall at SWMU 49.

J Avenue Outfall

Summary of RFI – In surface soil, SVOCs were identified as COPCs. No COPCs were identified in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers.

The sitewide ecological RA classified the J Avenue Outfall as presenting a moderate but not unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs for actual current (and realistic future) industrial workers are below target values. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – No COCs were identified at the J Avenue Outfall. Therefore, also considering the results of the human health RA, only one management measures alternative – deed restrictions to prevent future residential development of this area – was considered. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented under Alternative 1 for the Sewer Line – Southern Area.

Evaluation of Alternative – The application of deed restrictions at the J Avenue Outfall at SWMU 49 meets the evaluation criteria, as detailed below:

- Technical criteria

  - Performance – Deed restrictions limit future exposure by preventing residential use of the J Avenue Outfall at SWMU 49 and thus meet the CAOs. Deed restrictions are applicable to both site and contaminant characteristics, and meet the identified goals with no decrease in effectiveness over time.

  - Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.

  - Implementability – Because SWMU 49 is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.

  - Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.

- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil.

- Environmental assessment – The deed restrictions alternative has no effects on the ecological environment surrounding the site.

- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing future residential development at this site.

- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use is the recommended alternative for the J Avenue Outfall at SWMU 49.

K Avenue Outfall

Summary of RFI – In surface soil, metals and SVOCs were identified as COPCs. No COPCs were identified in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers.

The sitewide ecological RA classified the K Avenue Outfall as presenting a moderate but not unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs for actual current (and realistic future) industrial workers are below target values. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – No COCs were identified at the K Avenue Outfall. Therefore, also considering the results of the human health RA, only one management measures alternative – deed

restrictions to prevent future residential development of this area – was considered. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented under Alternative 1 for Sewer Line – Southern Area.

Evaluation of Alternative – The application of deed restrictions at the K Avenue Outfall at SWMU 49 meets the evaluation criteria, as detailed below:

- Technical criteria
  - Performance – Deed restrictions limit future exposure by preventing residential use of the K Avenue Outfall at SWMU 49 and thus meet the CAOs. Deed restrictions are applicable to both site and contaminant characteristics, and meet the identified goals with no decrease in effectiveness over time.
  - Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.
  - Implementability – Because SWMU 49 is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.
  - Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.
- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil.
- Environmental assessment – The deed restrictions alternative has no effects on the ecological environment surrounding the site.
- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing future residential development at this site.
- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use is the recommended alternative for the K Avenue Outfall at SWMU 49.

SWMU 50 (COMPRESSOR CONDENSATE DRAINS, BUILDINGS 613 AND 619)

Site Background – SWMU 50 is located within the BRAC parcel and is designated for future industrial use. It consists of two compressor condensate drains located adjacent to Buildings 613 and 619. Because these two buildings are 800 to 1,000 feet apart, each area was evaluated separately.

Buildings 613 and 619 housed large air compressors associated with the vehicle maintenance mission of TEAD. Standard procedure for the collection of condensate at these locations was to pipe the liquid into a partially buried 55-gallon drum with a perforated base. The effluent flowed from the compressor through the gravel-filled drum and into underlying soil. In the course of transport, the effluent moved through an open area, which may have been contaminated by lubricating oil from the compressor, inorganics from metal wear, or unknown materials from the indiscriminate disposal of waste at the drain.

The Building 613 Compressor Condensate Drain is located along the west wall within an area of approximately 20 square feet. An air handling unit is located west of the drain, and an air duct connects the unit to the building. Access to the drain is possible only from the north because the proximity of the buildings and the presence of the air duct limit the amount of exposed soil.

The Building 619 Compressor Condensate Drain is located along the north wall of the central wing. It is located in an area of approximately 15 square feet, surrounded by exposed soil, and flanked to the south and east by buildings. The remaining surface soil in the area is overlain by 8 to 12 inches of reinforced concrete.

As a result of the BRAC process, all activities associated with operations at Buildings 613 and 619 have ceased. The drums and underlying soil at both buildings were excavated and removed during the RCRA Facility Investigation. These buildings have been closed and targeted for reuse in accordance with the TEAD Conversion and Reuse Plan.

Building 613 Drain

Summary of RFI – Metals and SVOCs were identified as COPCs in subsurface soil. Surface soil was not analyzed at this area.

Summary of RAs – The human health RA identified elevated HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for future construction workers. In addition, risks and hazards were not calculated for actual current (and realistic future) industrial workers because these receptors are exposed to surface soil only, and surface soil was not analyzed at this area.

The sitewide ecological RA classified the Building 613 Compressor Condensate Drain as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs were not calculated for actual current (and realistic future) industrial workers because they are expected to be exposed to surface soil only, and surface soil was not analyzed at this area. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – No COCs were identified at the Building 613 Compressor Condensate Drain. Therefore, also considering the results of the

human health RA, only one management measures alternative – deed restrictions to prevent future residential development of this area – was considered. Deed restrictions are legally binding and are incorporated into the deed created for the transfer of the BRAC parcel from TEAD to the buyer. Deed restrictions on the BRAC property are governed by the CCRs. In addition to the existing CCRs, a site management plan will be delivered upon acceptance of the Decision Document. In this plan, the area subject to deed restrictions is surveyed and defined legally. This plan also describes the restrictions that apply to the SWMU and periodic inspections and monitoring to ensure the deed restrictions are being observed. The site management plan will become part of TEAD's RCRA Corrective Action and Post Closure Monitoring Permit. In addition, the RCRA Post Closure Permit shall be reviewed every 5 years.

Evaluation of Alternative – The application of deed restrictions at Building 613 Compressor Condensate Drain of SWMU 50 meets the evaluation criteria, as detailed below:

- Technical criteria
  - Performance – Deed restrictions limit future exposure by preventing residential use of this area of SWMU 50 and thus meet the CAOs. Deed restrictions are applicable to both site and contaminant characteristics, and meet the identified goals with no decrease in effectiveness over time.
  - Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.
  - Implementability – Because SWMU 50 is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.
  - Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.
- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil.
- Environmental assessment – The deed restrictions alternative has no effects on the ecological environment surrounding the site.
- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing future residential development at this site.
- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use is the recommended alternative for the Building 613 Compressor Condensate Drain.

Building 619 Drain

Summary of RFI – VOCs and SVOCs were identified as COPCs in surface soil, and metals

and SVOCs were identified as COPCs in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers.

The sitewide ecological RA classified the Building 619 Compressor Condensate Drain as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs for actual current (and realistic future) industrial workers are below target values. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternatives – No COCs were identified in surface soil, and arsenic was identified as a COC in subsurface soil. However, arsenic was detected only slightly above its EPA screening level CAO in one subsurface soil sample. The arsenic detection is below its CAO corresponding to the 10^{-4} Utah "Risk Rule" level. Therefore, also considering the results of the human health RA, two corrective measures alternatives were considered, as described below.

Alternative 1 – Deed Restrictions

This alternative is the application of deed restrictions to prevent future residential development of this area. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented in the Identification of Correction Measures Alternative section for the Building 613 Drain.

Alternative 2 – Excavation and Off-Post Treatment/Disposal

This corrective measures alternative includes excavation of an estimated 18 yd^3 of contaminated soil to a depth of approximately 8 feet using an excavator, backhoe, or similar equipment. Because the extent of contamination is estimated to be similar under industrial or residential evaluation criteria, cleanup to residential CAOs is recommended, and deed restrictions will not be necessary. Excavation and confirmatory sampling continue until the concentrations of arsenic is detected below its residential use CAO.

If the soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), the excavated soil is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. It is assumed that the contaminated soil is sent to a TSDF for pretreatment to comply with applicable RCRA LDRs. However, if the soil results are acceptable, the soil may be sent to a Subtitle D landfill.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and covered with gravel or asphalt.

Evaluation of Alternatives – The proposed corrective measures alternatives for the Building 619 Compressor Condensate Drain are evaluated and compared below:

- Technical criteria

- Performance – Both Alternative 1 (deed restrictions) and Alternative 2 (excavation and off-post treatment/ disposal) are rated high with respect to performance. Both alternatives meet the CAOs. Alternative 2 has an advantage over Alternative 1 in terms of long-term effectiveness. Alternative 2 removes the contaminated soil to residential levels and so no deed restrictions are required.

- Reliability – Alternatives 1 and 2 are rated high for reliability. Each alternative has been proven effective at other sites and does not require onsite O&M activities – though O&M and long-term monitoring are required at the off-post landfills.

- Implementability – Alternative 1 is easy to implement, and is rated high. Alternative 2 is rated moderate because although equipment and contractors for excavation and removal are readily available, excavation shoring will be necessary and subsurface utilities may affect excavation activities.

- Safety – Alternative 1 is rated high because no intrusive activities are required. Alternative 2 is rated moderate because it requires handling of contaminated soil and transporting the soil offsite for treatment/disposal. It presents short-term exposure to both onsite workers and offsite residential communities.

- Human health assessment – Both Alternatives 1 and 2 are rated high because they protect human health by preventing residential exposure to the identified contaminants. Alternative 2 also removes soil with arsenic above its CAO. However, risks and HIs for industrial and construction workers are below target values and so Alternative 1 is also protective of human health. In addition, the COC is 5 feet bgs so exposure will only occur if the subsurface soil is excavated.

- Environmental assessment – Both alternatives are rated high because they have no effects on the ecological environment which was identified as having low ecological risks.

- Administrative feasibility – Both Alternatives 1 and 2 are rated high. Both alternatives meet the requirements of UAC R315-101. Alternative 1 also requires deed restrictions.

- Cost – Of the two alternatives, Alternative 1 is the least costly – with an estimated total present worth cost of $12,000. The cost for Alternative 2 is estimated at $26,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use (Alternative 1) is the recommended alternative for the Building 619 Compressor Condensate Drain.

SWMU 51 (CHROMIC ACID/ALODINE DRYING BEDS)

Site Background – SWMU 51 is located within the BRAC parcel and is designated for future industrial use. It consists of four concrete pads near the western edge of the Maintenance Area. The pads are located on an open lot adjacent to the southern end of the Consolidated Maintenance Facility. Installation records identify SWMU 51 as Facility 623. Each of the two eastern pads is 14 feet square, with a slot cut from the center to the western edge. Each of the two western pads is 20 feet square, with a berm around each edge to contain runoff and sediment. The western pads are located approximately 20 feet downslope of the eastern pads. Topography at SWMU 51 slopes toward the west-southwest, and runoff from precipitation tends to pond approximately 50 feet southwest of the western pads.

SWMU 51 is no longer used; however, during the 1970s, the pads were used as drying beds for chromic acid and alodine wastes. Additional information indicated that radiator and engine fluids may have been flushed/drained at the pads.

Summary of RFI – Metals and SVOCs were identified as COPCs in both surface and subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers. In addition, all projected blood lead concentrations are less than the CDC target of 10 μg/dL.

The sitewide ecological RA classified SWMU 51 as presenting a moderate but not unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. However, the identified risks and hazards to actual current (and realistic future) industrial workers are below target levels. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternative – One SVOC was identified as a COC in surface soil; it was detected at a concentration only slightly above its CAO and at one location only. The EPC for this contaminant is below its CAO. No COCs were identified in subsurface soil. Therefore, also considering the results of the human health RA, only one management measures alternative – deed restrictions to prevent future residential development of SWMU 51 – was considered. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Deed restrictions on the BRAC property are governed by the CCRs. In addition to the existing CCRs, a site management plan will be delivered upon acceptance of the Decision Document. In this plan, the area subject to deed restrictions is surveyed and legally defined. This plan also describes the restrictions that apply to the SWMU and periodic inspections and monitoring to ensure the deed restrictions are being observed. The site management plan will become part of TEAD's RCRA Corrective Action and Post Closure Monitoring Permit. In addition, the RCRA Post Closure Permit shall be reviewed every 5 years.

Evaluation of Alternative – The application of deed restrictions at SWMU 51 meets the evaluation criteria, as detailed below:

- <u>Technical criteria</u>

- Performance – Deed restrictions limit future exposure by preventing residential use of SWMU 51 and thus meet the CAOs. Deed restrictions are applicable to both site and contaminant characteristics, and meet the identified goals with no decrease in effectiveness over time.

- Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.

- Implementability – Because SWMU 51 is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.

- Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.

- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in surface soil.

- Environmental assessment – The deed restrictions alternative has no effects on the ecological environment surrounding the site.

- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing future residential development at this site.

- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use is the recommended alternative for the Chromic Acid/Alodine Drying Beds (SWMU 51).

SWMU 52 (POSSIBLE DRAIN FIELD/ DISPOSAL TRENCHES)

Site Background – SWMU 52 is located within the Administration Area of TEAD. This SWMU is part of the BRAC parcel and is designated for future residential use. It consists of four separate areas (SWMUs 52A, B, C, and D):

- The Phase I investigation identified an extensive drainage system of terra cotta piping at SWMU 52A, Possible Drain Field. There were no signs of visible contamination, and the analytical results did not indicate the presence of residual contamination. No risks or hazards were identified for this area and "no action" was recommended.

- The Disposal Trenches (SWMU 52B) consist of a long mounded trench, approximately 150 by 40 feet, and several smaller mounds. Pieces of construction rubble and debris are present at the surface and buried throughout the mounded area. The field investigation of SWMU 52B confirmed that the trenches were used to dispose of rubble, and no significant contamination was detected. No further sampling was considered to be necessary.

- A Charcoal Material Area (SWMU 52C) was observed on the ground surface throughout the Possible Drain Field. The material was distributed in various-sized piles throughout an area of approximately 19.5 acres.

- The Horse Stable Area (SWMU 52D) was identified as an area of interest because several pesticides had been detected in surface soil samples collected during an earlier investigation.

The RFI recommended that the Disposal Trenches (SWMU 52B), Charcoal Material Area (SWMU 52C), and the Horse Stable Area (SWMU 52D) be included in the CMS. Therefore, the remainder of this section discusses these three locations only.

Disposal Trenches (SWMU 52B)

Summary of RFI – In subsurface soil, metals were identified as COPCs. Surface soil was not analyzed at this area.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for realistic onsite adult and child residents. No elevated cancer risks or HIs were identified for future construction workers. In addition, risks and hazards were not calculated for actual current industrial workers because these receptors are exposed to surface soil only, and surface soil was not analyzed at this area.

The sitewide ecological RA classified SWMU 52B as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated.

Identification of Corrective Measures Alternatives – No COCs were identified in subsurface soil at SWMU 52B. Risks and HIs for future adult and child residents – the realistic future receptors – are based on exposure to subsurface soil and exceed target levels. The elevated HIs result from elevated thallium found at 11.5 feet and 10 feet bgs. The elevated risk under the residential exposure scenario is due to the presence of beryllium, which was detected at a concentration below the comprehensive basewide background level. Risks and HIs to all other receptors are below target values.

Therefore, only one management measures alternative – deed restrictions to limit future residential development of this area – was considered. The restriction will prevent excavation of subsurface soil. These restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer.

Deed restrictions on the BRAC property are governed by the CCRs. In addition to the existing CCRs, a site management plan will be delivered upon acceptance of the Decision Document. In this plan, the area subject to deed restrictions is surveyed and defined legally. This plan also describes the restrictions that apply to the SWMU and periodic inspections and monitoring to ensure the deed restrictions are being observed. The site management plan will become part of TEAD's RCRA Corrective Action and Post Closure Monitoring Permit. In addition, the RCRA Post Closure Permit shall be reviewed every 5 years.

Evaluation of alternative – The application of deed restrictions at SWMU 52B meets the evaluation criteria, as detailed below:

- Technical criteria
  - Performance – Deed restrictions limit future exposure by preventing residential exposure to subsurface soil at SWMU 52B and also meet the CAOs. This alternative is applicable to both site and contaminant characteristics, and meets the identified goals with no decrease in effectiveness over time.
  - Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.
  - Implementability – Because SWMU 52B is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.
  - Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.
- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to subsurface soil.
- Environmental assessment – The deed restriction alternative has no effects on the ecological environment surrounding SWMU 52B.
- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing residential exposure to subsurface soil.
- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent excavation of subsurface soil is the recommended alternative for SWMU 52B.

Charcoal Material Area (SWMU 52C)

Summary of RFI – During the Phase I and Phase II RFIs, three types of samples were collected – charcoal material and surface soil, soil beneath charcoal material, and surface soil from areas free of charcoal material.

- In samples of charcoal material and surface soil, VOCs and SVOCs were identified as COPCs.
- In subsurface soil directly below charcoal material, VOCs and SVOCs were identified as COPCs.
- One SVOC was detected in surface soil from areas free of charcoal material.

Summary of RAs – At SWMU 52C, risks were calculated separately for charcoal material and surface soil, soil beneath charcoal material, and soil in areas free of charcoal material:

- For exposure to charcoal material and surface soil, elevated cancer risks and HIs were identified for realistic onsite adult and child residents. No elevated cancer risks and HIs were identified for actual current industrial workers or future construction workers.
- For soil beneath charcoal material, elevated cancer risks were identified for realistic onsite adult and child residents and HIs were identified for child residents. No elevated cancer risks and HIs were identified for actual current industrial workers or future construction workers.
- For soil in areas free of charcoal material, cancer risks and HIs for all receptors (realistic onsite residents, current industrial workers, and future construction workers) are below target levels.

The sitewide ecological RA classified SWMU 52C as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for realistic onsite residents exposed to charcoal material and soil, the Risk Rule requires that corrective actions be evaluated for this area of SWMU 52C. Likewise, because no adverse health effects were identified for realistic onsite residents exposed to surface soil in areas free of charcoal material, no corrective measures are considered for that area of SWMU 52C.

Identification of Corrective Measures Alternative – One SVOC was identified as a COC in charcoal material. No COCs were identified for any other materials. Therefore, also considering the results of the human health RA, only one corrective measures alternative is evaluated for SWMU 52C.

Excavation and off-post treatment/disposal include excavation of an estimated 1,890 yd^3 of charcoal and surface soil to a depth of 1 foot using an excavator, backhoe, or similar equipment. The area of excavation is based on a visual observation survey of charcoal material performed before material removal begins. Excavation and confirmatory sampling continue until the concentrations of benzo(a)anthracene are detected below residential use CAOs.

If the excavated material is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), it is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. However, if the material is not hazardous it may be sent to a Subtitle D landfill. It is assumed that the material is not hazardous based on a preliminary review of the site contamination.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded to natural conditions.

Evaluation of Alternative – Excavation and off-post treatment/disposal at SWMU 52C meet the evaluation criteria, as detailed below:

- Technical criteria

  - Performance – Excavation and off-post treatment/disposal of contaminated charcoal material/soil meet the CAOs for SWMU 52C. Off-post landfill disposal reduces the mobility of contaminants. This alternative also complies with UAC R315-101-3, the "Principle of Non-Degradation," by removing contaminated soil from the site. This alternative is applicable to both site and contaminant characteristics, and meets the identified goals with no decrease in effectiveness over time.

  - Reliability – Excavation and off-post treatment/disposal are effective over the long term and have been implemented at many sites with positive results. Management of waste materials is limited to contaminated soil, and no long-term environmental monitoring is required. However, some degree of long-term liability may be associated with off-post disposal.

  - Implementability – This alternative is technically and administratively feasible at this site. Excavation equipment is readily available, and suitable landfills are located within 100 to 200 miles of TEAD. Because this alternative involves excavating soil to a depth of 1.5 feet bgs only, the presence of subsurface utilities does not significantly affect its implementation. Required equipment and materials are readily available. To meet CAOs, 6 to 8 weeks is required for excavation, off-post transportation/ disposal, and backfilling.

  - Safety – Excavation and off-post disposal of surface soil pose minimal-to-moderate short-term threats to workers, off-post residential communities, and the environment. Potential threats from excavation are minimized by observing standard safety procedures (e.g., dust suppression, personal protective equipment).

- Human health assessment – Excavation and off-post treatment/disposal of contaminated soil protect human health by preventing both short- and long-term exposure to the soil.

- Environmental assessment – This alternative further reduces the already low ecological risk at SWMU 52C.

- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 and UAC R307-12, Fugitive Emissions and Fugitive Dust. The excavated soil is transported in accordance with DOT regulations.

- Cost – The estimated present worth cost of implementing Alternative 1 is $550,000.

Recommended Alternative – Excavation and off-post treatment/disposal of contaminated charcoal material and surface soil is the recommended alternative for the Charcoal Material Area (SWMU 52C).

Horse Stable Area (SWMU 52D)

Summary of RFI – ***Pesticides*** were identified as COPCs in both surface and subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks for realistic onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current industrial workers or future construction workers.

The sitewide ecological RA classified the Horse Stable Area as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for realistic onsite residents, corrective actions are evaluated for this area of SWMU 52.

Identification of Corrective Measures Alternative – One pesticide was identified as a COC in surface soil at SWMU 52D. No COCs were identified in subsurface soil. Therefore, also considering the results of the human health RA, only one corrective measures alternative is evaluated for SWMU 52D.

Excavation and off-post treatment/disposal includes excavation of an estimated 28 yd^3 of contaminated soil to a depth of 1.5 feet using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until the concentration of chlordane is detected below the residential use CAOs.

If the soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), the excavated soil is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. It is assumed that the contaminated soil is sent to a TSDF for pretreatment by incineration to comply with applicable RCRA LDRs. However, if the soil results are acceptable, the soil may be sent to a subtitle D landfill.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded to natural conditions.

The soil contamination at this site may be included as part of the SWMU 35 (Operable Unit 4) corrective measures action, which also includes excavation of pesticides-contaminated soil in the immediate area of SWMU 52D.

Evaluation of Alternative – Excavation and off-post treatment/disposal at SWMU 52D meets the evaluation criteria, as detailed below:

- Technical criteria
  - Performance – Excavation and off-post treatment/disposal of contaminated soil meets the CAOs for SWMU 52D. Off-post incineration and disposal in a Subtitle C landfill reduce the toxicity and mobility of contaminants. It is applicable to both site and contaminant characteristics, and meets the identified goals with no decrease in effectiveness over time.
  - Reliability – Excavation and off-post treatment/disposal is effective over the long term and has been implemented at many sites with positive results. Management of waste materials is limited to contaminated soil, and no long-term environmental monitoring is required. However, some degree of long-term liability may be associated with off-post disposal.

- Implementability – This alternative is technically and administratively feasible at this site. Excavation equipment is readily available, and both a Subtitle C landfill and a TSDF are located within 100 miles of TEAD. Because this alternative involves excavating soil to a depth of 1 foot bgs only, the presence of subsurface utilities does not significantly affect its implementation. Required equipment and materials are readily available. To meet CAOs, approximately 2 weeks is required for excavation, off-post transportation/ disposal, and backfilling.

- Safety – Excavation and off-post treatment/disposal of surface soil pose minimal-to-moderate short-term threats to workers, off-post residential communities, and the environment. Potential threats from excavation are minimized by observing standard safety procedures (e.g., dust suppression, personal protective equipment).

- Human health assessment – Excavation and off-post treatment/disposal of contaminated soil protect human health by preventing both short- and long-term exposure to the soil.

- Environmental assessment – This alternative further reduces the low ecological risk at SWMU 52D.

- Administrative feasibility – This alternative meets applicable regulations and UAC R307-12, Fugitive Emissions and Fugitive Dust. The excavated soil is transported in accordance with DOT regulations.

- Cost – The estimated present worth cost of implementing Alternative 1 is $41,000. However, the soil contamination at this site may be included as part of the SWMU 35 corrective measures action.

Recommended Alternative – Excavation and off-post disposal of contaminated soil is the recommended alternative for SWMU 52D.

SWMU 54 (SANDBLAST AREAS)

Site Background – SWMU 54 is located within the BRAC parcel and is to be used for industrial/commercial purposes in accordance with the TEAD Conversion and Reuse Plan. This SWMU includes three buildings where sandblasting occurred:

- Building 604, Power Train and Special Equipment Branch.
- Building 611, Military Standard Engine and Small Generator Overhaul.
- Building 637, Engine Rebuild.

No sandblasting has been conducted at SWMU 54 since 1994. (The primary areas associated with sandblasting activities at the TEAD Maintenance Area are located in Buildings 615/617 and Building 600. These buildings are not included in SWMU 54, and are addressed in the Group B CMS Work Plan.

The sandblast units at SWMU 54 were located inside Buildings 604, 611, and 637. Three types of sandblast media (i.e., steel grit, ground walnut shells, and glass beads) were used. The spent media had the consistency of fine dust and was collected in sealed hoppers located outside the buildings.

Power trains were assembled and disassembled, and brake overhauls and brake shoe manufacturing were conducted in Building 604. Solvents and a vapor degreaser were used for cleaning and loosening parts. Several cabinet blast boxes were also used with glass-bead and walnut-grit abrasives. The collection hopper was located on a concrete pad along the southeastern side of the building.

Engines and generators were disassembled, overhauled, and reassembled in Building 611. Small parts needing rust removal were cleaned in a small grit sandblaster using glass-bead or steel-grit abrasives. The hopper was located on a concrete pad on the northwestern side of the building. A loading dock is located north of the concrete pad. An indoor small arms firing range was also located within Building 611. Spent lead bullets from the firing range were removed from the building to an area south of the concrete pad.

In Building 637, engines were steam cleaned and disassembled, and paint and rust were removed using dip tanks and steel-grit blasting machines. The collection hopper was located on the northwest side of the building; the area beneath the hopper was covered by loose gravel and ballast from an adjacent railroad spur.

Building 604

Summary of RFI – Metals and SVOCs were identified as COPCs in surface soil, and metals were identified as COPCs in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers.

The sitewide ecological RA classified Building 604 as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs for actual current (and realistic future) industrial workers are below target values. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternatives – No COCs were identified at Building 604 at SWMU 54. A review of the human health RA conducted in the RFI indicates that beryllium and thallium drive the unacceptable noncancer HI, even though their concentrations are below their CAOs. Beryllium was detected in one subsurface sample (5 feet bgs) at a concentration of 1.34 µg/g, which is below the comprehensive basewide background value of 1.5 µg/g. Thallium was also detected in only one sample location, at a concentration of 14.5 µg/g, which is below the comprehensive basewide background level of 54 µg/g. Therefore, no corrective measures are recommended for Building 604 of SWMU 54.

Building 611

Summary of RFI – Metals and SVOCs were identified as COPCs in surface soil, and metals were identified as COPCs in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks, HIs, and blood lead levels for onsite adult and child residents. In addition, elevated blood lead levels were identified for current (and realistic future) industrial workers and future construction workers.

The sitewide ecological RA classified Building 611 at SWMU 54 as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Also, elevated blood lead levels were identified for the actual current (and realistic future) industrial worker. Therefore, corrective actions must be evaluated.

Identification of Corrective Measures Alternatives – Several metals were identified as COCs in surface soil. No COCs were identified in subsurface soil. Therefore, also considering the results of the human health RA, several corrective actions are considered, as described below.

Alternative 1 – Excavation, Off-Post Treatment/ Disposal, and Deed Restrictions

This corrective measures alternative includes excavation of an estimated 160 yd^3 of contaminated soil to a depth of 2 feet using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until the concentrations of cadmium and lead are detected below industrial use CAOs.

If the soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), the excavated soil is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. It is assumed that the contaminated soil is sent to a TSDF for pretreatment to comply with applicable RCRA LDRs. However, if the soil results are acceptable, the soil may be sent to a Subtitle D landfill or to a local asphalt batching plant.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded and covered with gravel.

Deed restrictions to prevent future residential use of the site are also included as part of this alternative. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Deed restrictions on the BRAC property are governed by the CCRs. In addition to the existing CCRs, a site management plan will be delivered upon

acceptance of the Decision Document. In this plan, the area subject to deed restrictions is surveyed and legally defined. This plan also describes the restrictions that apply to the SWMU and periodic inspections and monitoring to ensure the deed restrictions are being observed. The site management plan will become part of TEAD's RCRA Corrective Action and Post Closure Monitoring Permit. In addition, the RCRA Post Closure Permit shall be reviewed every 5 years.

Alternative 2 – Excavation, Soil Washing, and Deed Restrictions

This alternative includes excavation of contaminated soil at levels above industrial use CAOs (described in Alternative 1), treatment of the contaminated soil onsite through ***soil washing***, and off-post treatment/disposal of the soil washing residuals waste stream at an appropriate TSDF or landfill. Soil washing separates fine, contaminated soil from coarse, clean soil particles. The clean soil can then be placed back into the excavated area. Deed restrictions (described in Alternative 1) to prevent future residential use of the site are also part of Alternative 2.

Alternative 3 – Excavation, Solidification/ Stabilization, and Deed Restrictions

This alternative includes excavation of contaminated soil at levels above industrial use CAOs (described in Alternative 1), and treatment of the contaminated soil onsite through ***solidification/stabilization***. This process binds the soil with a material such as cement to reduce the mobility of metals. Deed restrictions (described in Alternative 1) to prevent future residential use of the site are also part of Alternative 3.

Evaluation of Alternatives – The proposed corrective measures alternatives for Building 611 of SWMU 54 are evaluated and compared below.

- Technical criteria
  - Performance – Alternative 1 (excavation, off-post treatment/disposal, and deed restrictions), Alternative 2 (excavation, soil washing, and deed restrictions), and Alternative 3 (excavation, solidification/stabilization, and deed restrictions) each meet both the qualitative and quantitative CAOs. However, Alternative 1 is rated high with respect to performance, while Alternatives 2 and 3 are rated moderate because each requires pretreatment testing.
  - Reliability – Alternative 1 is rated high for reliability because it has been proven effective at other sites and does not require onsite O&M activities. Alternatives 2 and 3 are rated moderate because pretreatment testing is required to further evaluate their effectiveness and permanence; 5-year site inspections are recommended to ensure the long-term effectiveness of the solidification/ stabilization process.
  - Implementability – Alternative 1 is easy to implement and is rated high. Equipment and contractors for excavation and for treatment/disposal are readily available. Alternatives 2 and 3 are rated moderate because of the limited number of vendors capable of performing the treatment processes.
  - Safety – Alternative 1 is rated moderate because it requires handling of contaminated soil and transporting the

soil offsite for disposal. It presents short-term exposure to both onsite workers and offsite residential communities. Alternatives 2 and 3 require more onsite handling of contaminated soil than Alternative 1 due to soil washing or solidification/ stabilization, but a lower volume of material is transported off post; they are also rated moderate.

- Human health assessment – Alternatives 1, 2, and 3 are each rated high because they either remove contaminated soil from the site, or remove contaminants from soil that remains onsite.

- Environmental assessment – All three alternatives are rated high because they further reduce the already low ecological risk at Building 611.

- Administrative feasibility – Alternative 1 is rated high because it meets the requirements of UAC R315-101. While Alternatives 2 and 3 also meet these requirements, they are rated moderate because they may require a RCRA permit for treating hazardous waste.

- Cost – Of the three alternatives, Alternative 1 is the least costly – with an estimated total present worth cost of $120,000. The costs for Alternatives 2 and 3 are estimated at $260,000 and $210,000, respectively.

Recommended Alternative – Excavation, off-post treatment/disposal, and deed restrictions (Alternative 1) is the recommended alternative for Building 611 of SWMU 54.

Building 637

Summary of RFI – Metals and SVOCs were identified as COPCs in both surface and subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers. Also, all projected blood lead levels are below the CDC target of 10 µg/dL.

The sitewide ecological RA classified Building 637 at SWMU 54 as presenting a low ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated. Risks and HIs for actual current (and realistic future) industrial workers are below target values. Therefore, only management measures must be considered.

Identification of Corrective Measures Alternatives – Two SVOCs were identified as COCs in surface soil, though at concentrations only slightly above CAOs and at only two locations. No COCs were identified in subsurface soil. Therefore, also considering the results of the human health RA, only one management measures alternative – deed restrictions to prevent future residential development of this area – was considered. Deed restrictions are legally binding and are incorporated into the permanent deed created for the transfer of the BRAC parcel from TEAD to the buyer. Additional information concerning deed restrictions is presented under alternative 1 for Building 611.

Evaluation of Alternative – The application of deed restrictions at Building 637 at SWMU 54 meets the evaluation criteria, as detailed below:

- Technical criteria
  - Performance – Deed restrictions limit future exposure by preventing residential use of Building 637 at SWMU 54 and thus meet the CAOs. Deed restrictions are applicable to both site and contaminant characteristics, and meet the identified goals with no decrease in effectiveness over time.
  - Reliability – Deed restrictions are effective over the long term and have been implemented at many sites with positive results. No additional exposure should occur while the restrictions are in place. No O&M, management of waste materials, or long-term environmental monitoring is required.
  - Implementability – Because SWMU 54 is part of the BRAC parcel, this alternative requires the placement of legally binding restrictions on the property. This alternative is technically and administratively feasible, and immediately meets the CAOs.
  - Safety – Safety issues are not applicable because no intrusive activities are required for implementation of deed restrictions.
- Human health assessment – Restricting future development of the site protects human health by preventing residential exposure to the previously identified contaminants in soil.
- Environmental assessment – The deed restrictions alternative has no effects on the ecological environment surrounding the site.
- Administrative feasibility – This alternative meets the specified requirements of UAC R315-101 by preventing future residential development at this site.
- Cost – The estimated present worth cost of implementing this corrective measures alternative is $12,000.

Recommended Alternative – The application of deed restrictions to prevent future residential use is the recommended alternative for Building 637 at SWMU 54.

SWMU 56 (GRAVEL PIT)

Site Background – SWMU 56 is located within the TEAD Maintenance Area. This SWMU is part of the BRAC parcel and is to be used for industrial purposes. The Gravel Pit is a low-lying area, approximately 4 acres in size. It is surrounded on the north, east, and south sides by a ridge that defines the perimeter. Residual piles of cobbles are located throughout the southern portion of the pit. An area of discolored soil, covering approximately 5,400 square feet, is also located at the southern end of the pit; it is referred to as the Burned Area.

The Gravel Pit was identified during an aerial photographic site analysis of the Maintenance Area. The photographs showed an area of disturbed ground located east of Building 699, along the northeast perimeter of the Depot. During a site walkover, vehicle components and containers were observed on the surface.

Summary of RFI – In the Burned Area surface soil, metals and SVOCs were identified as COPCs. In the Burned Area subsurface soil, metals, SVOCs, and pesticides were identified as COPCs.

In the Nonburned Area soil, metals and SVOCs were identified as COPCs in surface soil. Subsurface soil was not analyzed.

Summary of RAs – In the Burned Area, the human health RA identified elevated cancer risks and HIs for onsite adult and child residents, and elevated blood lead levels for onsite child residents. In addition, an elevated HI was identified for current (and realistic future) industrial workers, and an elevated blood lead level was identified for future construction workers. No other elevated cancer risks, HIs, or blood lead levels were identified.

In the Nonburned Area, the human health RA identified elevated HIs for onsite adult and child residents. No elevated cancer risks or HIs were identified for actual current (and realistic future) industrial workers or future construction workers.

The sitewide ecological RA classified both areas of SWMU 56 as presenting a moderate but not unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for onsite residents, the Risk Rule requires that corrective measures be evaluated.

Identification of Corrective Measures Alternatives – No COCs were identified at SWMU 56. However, corrective action is evaluated for the Burned Area because of the unacceptable human health RA results. The human health RA demonstrated that removal of the Burned Area soil should reduce cancer risks to acceptable levels for all receptors. Therefore, considering the results of the human health RA, two alternatives are considered:

Alternative 1 – Deed Restrictions

This alternative is the application of deed restrictions to prevent future residential use of the site. These restrictions are legally binding and are incorporated into the deed created for transfer of the BRAC parcel from TEAD to the buyer. Deed restrictions on the BRAC property are governed by the CCRs. In addition to the existing CCRs, a site management plan will be delivered upon acceptance of the Decision Document. In this plan, the area subject to deed restrictions is surveyed and defined legally. This plan also describes the restrictions that apply to the SWMU and periodic inspections and monitoring to ensure the deed restrictions are being observed. The site management plant will become part of TEAD's RCRA Corrective

Action and Post Closure Monitoring Permit. In addition, the RCRA Post Closure Permit shall be reviewed every 5 years.

Alternative 2 – Excavation and Off-Post Treatment/Disposal

This corrective measures alternative includes excavation of an estimated 400 yd^3 of contaminated surface soil in the Burned Area to a depth of 2 feet using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until the concentrations of antimony and lead are detected below residential CAOs; this eliminates the need for deed restrictions.

If the soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), the excavated soil is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. It is assumed that the contaminated soil is sent to a TSDF for pretreatment to comply with applicable RCRA LDRs. However, if the results are acceptable, the soil may be sent to a Subtitle D landfill or a local asphalt batching plant.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded to natural conditions.

Evaluation of Alternatives – The proposed corrective measures alternatives for SWMU 56 are evaluated and compared below:

- Technical criteria
  - Performance – Alternative 1 (deed restrictions) is rated low with respect to performance, while Alternative 2 (excavation and off-post treatment/ disposal) is rated high. Alternative 1 does not meet CAOs because it has no effect on the unacceptable HIs for industrial workers or the blood lead levels for construction workers at the Burned Area. Only Alternative 2 meets the CAOs. Alternative 2 also has an advantage over Alternative 1 in terms of long-term effectiveness; it removes the contaminated soil, and deed restrictions are not required.
  - Reliability – Alternatives 1 and 2 are rated high for reliability. Each alternative has been proven effective at other sites and does not require onsite O&M activities – though O&M and long-term monitoring are required at the off-post landfills.
  - Implementability – Both Alternatives 1 and 2 are easy to implement, and are rated high. Equipment and contractors for excavation and removal are readily available.
  - Safety – Alternative 1 is rated high because no intrusive activities are required. Alternative 2 is rated moderate because it requires handling of contaminated soil and transporting the soil offsite for treatment/disposal. It presents short-term exposure to both onsite workers and offsite residential communities.
- Human health assessment – Alternative 1 is rated low because unacceptable exposure for current and likely future industrial and construction workers remains at the Burned Area. Alternative 2 is rated high because it removes contaminated soil from the site.
- Environmental assessment – Alternative 2 is rated high because it reduces the ecological

risk by removal of the Burned Area soil. Alternative 1 is rated moderate because although it does not affect the ecological risk, the risk was identified as moderate but not unacceptable.

- Administrative feasibility – Alternative 1 is rated low because it requires deed restrictions, and unacceptable exposure remains onsite. Alternative 2 is rated high because it meets the requirements of UAC R315-101, and the U.S. Army preference for clean closure.

- Cost – Of the two alternatives, Alternative 1 is the least costly – with an estimated total present worth cost of $12,000. The cost for Alternative 2 is estimated at $240,000.

Recommended Alternative – Excavation and off-post treatment/disposal (Alternative 2) is the recommended alternative for SWMU 56.

SWMU 57 (SKEET RANGE)

Site Background – SWMU 57 is located in the northern portion of the Administration Area of TEAD, within the BRAC parcel, and is to be used for residential purposes. The Skeet Range was used for skeet and trap shooting beginning in 1978. At the time of the RFI, skeet shooting consisted of occasional competitions and infrequent target practice. The range no longer operates.

Onsite structures (Buildings 159, 160, 162, and 163) were evaluated for asbestos, radon, lead paint, and ***polychlorinated biphenyls*** (PCBs) as part of an environmental baseline survey in October 1996. Asbestos surveys were conducted in Buildings 160, 161, 162, and 163. No lead-based paint testing is planned for these buildings because they do not qualify as target facilities and do not present any potential for reuse as such.

TEAD records indicate that the use of lead shot has been prohibited since 1978; however, no documentation exists to indicate that this regulation was enforced at the Skeet Range. As a result, there is concern that lead shot may have been used and that lead contamination may exist in the impact area. In addition, a large quantity of clay target fragments has accumulated in the impact area; and because ***polycyclic aromatic hydrocarbons*** (PAHs) are used in the production of clay targets, there is concern about possible PAH contamination.

Summary of RFI – Metals and PAHs were identified as COPCs surface soil. No COPCs were identified in subsurface soil.

Summary of RAs – The human health RA identified elevated cancer risks and HIs for realistic onsite adult and child residents, and elevated blood lead levels for realistic child residents. Elevated cancer risks, HIs, and blood lead levels were also identified for actual current industrial workers and future construction workers.

The sitewide ecological RA classified SWMU 57 as presenting a potentially unacceptable ecological risk.

Regulatory Requirements – Because adverse health effects were identified for realistic onsite residents, the Risk Rule requires that corrective actions be evaluated.

Identification of Corrective Measures Alternatives – Several metals and PAHs were identified as COCs in surface soil. No COCs were identified in subsurface soil. Therefore, also considering the results of the human health RA, several corrective actions are considered:

<u>Alternative 1 – Excavation and Off-Post Treatment/Disposal</u>

This corrective measures alternative includes excavation of an estimated 3,520 yd^3 of contaminated soil to a depth of 1 foot using an excavator, backhoe, or similar equipment. Excavation and confirmatory sampling continue until the concentrations of metals and PAHs are detected below the residential use CAOs. Current PAH levels are as high as 200 µg/g.

If the soil is classified as hazardous based on the results of a soil profile analysis (including total waste and TCLP analysis), the excavated soil is transported to an off-post Subtitle C hazardous waste landfill for direct disposal or to a TSDF for treatment prior to disposal. It is assumed that the soil with metals contamination is sent to a TSDF for pretreatment to comply with applicable RCRA LDRs. It is assumed that the soil contaminated with PAHs will be non-hazardous and disposed at a Subtitle D landfill. However, if the results are acceptable, the soil could be used in asphalt or road base.

The excavated soil is transported and manifested in compliance with applicable regulations. Clean soil from an on-post borrow location is backfilled into the excavated areas, which are then graded to natural conditions.

Alternative 2 – Excavation, Soil Washing, and Off-Post Treatment/Disposal

This alternative includes excavation of contaminated soil at levels above residential use CAOs (described in Alternative 1). The metals-contaminated soil is treated on-site using soil washing techniques. Soil washing separates lead shot from coarse, clean soil particles and fine contaminated soil. Lead shot separated from soil during the soil washing process can be recycled. Soil that passes cleanup criteria is either disposed at a landfill or used as backfill. The metal-contaminated soil that still fails cleanup criteria after lead shot removal will be further treated onsite through solidification/stabilization. This treated material is then disposed at an off-post landfill or use on-post for backfill.

It is assumed that the soil contaminated with PAHs will be disposed at a Subtitle D landfill. However, if the results are acceptable, the soil could be used in asphalt or road base.

Alternative 3 – Excavation, Solidification/ Stabilization, and Off-Post Treatment/Disposal

This alternative includes excavation of contaminated soil at levels above residential use CAOs (described in Alternative 1). The metals-contaminated soil is treated onsite through solidification/stabilization and then disposed at an off-post landfill.

Solidification/stabilization binds the soil with a material such as cement to reduce the mobility of metals. Excavated areas are backfilled with clean soil.

It is assumed that the soil contaminated with PAHs will be disposed at a Subtitle D landfill. However, if the results are acceptable, the soil could be used in asphalt or road base.

Evaluation of Alternatives – The proposed corrective measures alternatives for SWMU 57 are evaluated and compared below:

- Technical criteria
  - Performance – Alternative 1 (excavation and off-post treatment/disposal) and Alternative 2 (excavation, soil washing, and off-post treatment/disposal) are rated high with respect to performance, while Alternative 3 (excavation, solidification/stabilization, and off-post treatment/disposal) is rated moderate. Each alternative meets both the qualitative and quantitative CAOs. Only Alternative 2 allows for recovery and recycling of most of the lead shot. However, both Alternatives 2 and 3 required pretreatment testing to show that can meet CAOs in a cost-effective manner.
  - Reliability – Alternative 1 is rated high for reliability because it has been proven effective at other sites and does not require onsite O&M activities. Alternatives 2 and 3 are rated moderate because pretreatment testing is required for each to further evaluate their effectiveness and permanence.
  - Implementability – Alternative 1 is easy to implement, and is rated high. Equipment and contractors for excavation, removal, and treatment/disposal are readily available. Alternatives 2 and 3 are rated moderate because on-site equipment and strict

operational controls will be necessary. Only a relatively limited number of vendors are capable of performing lead shot removal/stabilization. Alternative 2 also requires soil dewatering. Soil profile results conducted by Safety-Kleen show that the stabilized soil can be disposed in a landfill.

– Safety – Alternative 1 is rated moderate because it requires handling of contaminated soil and transporting the soil offsite for disposal. It presents short-term exposure to both onsite workers and offsite residential communities. Alternatives 2 and 3 require more onsite handling of contaminated soil than Alternative 1 due to soil washing and/or solidification/stabilization, but the material transported off post is treated; they are also rated moderate.

– Human health assessment – Alternatives 1, 2, and 3 are each rated high because they either remove contaminated soil from the site, or remove contaminants from soil that remains at the site.

– Environmental assessment – Alternatives 1, 2, and 3 are rated high for protection of ecological receptors; the removal of the metals- and the PAH-contaminated soil from SWMU 57 reduces potential ecological impacts by approximately 97 to 100 percent.

– Administrative feasibility – Alternative 1 is rated high because it meets the requirements of UAC R315-101. Alternative 1 has the least potential for operational problems because no on-site treatment is involved. While Alternative 2 also meets these requirements, it is rated moderate because it may require a RCRA permit for treating hazardous waste. Alternative 3 is rated moderate because placing the treated metals contaminated soil at another on-post location presents administrative difficulties so the treated soil is sent to an off-post landfill. Also Alternative 3 may require a RCRA permit for treating hazardous waste.

– Cost – Of the three alternatives, Alternative 1 costs the least – with an estimated total present worth cost of $1,400,000. The cost for Alternative 3 is estimated at $1,500,000. The cost for Alternative 2 is estimated at $1,600,000.

Recommended Alternative – Excavation and off-post treatment/disposal of contaminated soil (Alternative 1) is the recommended alternative for SWMU 57.

RECOMMENDED ALTERNATIVES

The recommended alternatives for each of the seven Group C SWMUs are listed below. Table 1 presents a comparative analysis of the alternatives.

- SWMU 49 (Stormwater/Industrial Wastewater Piping)
  - Sewer Line-Southern Area
    Deed restrictions
  - Sewer Line-Central Area
    Deed restrictions
  - Sewer Line-Northern Area
    Deed restrictions
  - Building 609
    No action
  - B Avenue Outfall
    Deed restrictions
  - G Avenue Outfall
    Excavation, off-post treatment/disposal, and deed restrictions
  - H Avenue Outfall
    Deed restrictions
  - J Avenue Outfall
    Deed restrictions
  - K Avenue Outfall
    Deed restrictions
- SWMU 50 (Compressor Condensate Drains, Buildings 613 and 619)
  - Building 613 Drain
    Deed restrictions
  - Building 619 Drain
    Deed restrictions
- SWMU 51 (Chromic Acid/Alodine Drying Beds)
  - Deed restrictions
- SWMU 52 (Possible Drain Field/Disposal Trenches)
  - 52B Disposal Trenches
    Deed restrictions
  - 52C Charcoal Material Area
    Excavation and off-post treatment/ disposal
  - 52D Horse Stable Area
    Excavation and off-post treatment/ disposal
- SWMU 54 (Sandblast Areas)
  - Building 604
    No action
  - Building 611
    Excavation, off-post treatment/disposal, and deed restrictions
  - Building 637
    Deed restrictions
- SWMU 56 (Gravel Pit)
  - Excavation and off-post treatment/disposal
- SWMU 57 (Skeet Range)
  - Excavation and off-post treatment/ disposal

TABLE 1

Summary of Comparative Analysis of Corrective Measures Alternatives
Group C SWMUs
Tooele Army Depot

SWMU	Technical Evaluation							
Corrective Measures Alternative (a)	**Performance**	**Reliability**	**Implementability**	**Safety**	**Human Health Assessment**	**Environmental Assessment**	**Administrative Feasibility**	**Cost ($)**
SWMU 49 STORMWATER/INDUSTRIAL WASTEWATER PIPING								
Sewer Line – Southern Area								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
Excavation, off-post treatment/ disposal, and deed restrictions	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Depth of contamination and presence of sewer line effect implementation	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	No effects	Meets requirements of UAC R315-101	47,000
Sewer Line – Central Area								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
Excavation, off-post treatment/ disposal, and deed restrictions	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Depth of contamination and presence of sewer line effect implementation	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	No effects	Meets requirements of UAC R315-101	52,000
Sewer Line – Northern Area								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
Building 609								
No action	---	---	---	---	---	---	---	---
B Avenue Outfall								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000

TABLE 1 (cont'd)

SWMU	Technical Evaluation							
Corrective Measures Alternative (a)	**Performance**	**Reliability**	**Implementability**	**Safety**	**Human Health Assessment**	**Environmental Assessment**	**Administrative Feasibility**	**Cost ($)**
G Avenue Outfall								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Prevents residential exposure but industrial workers exposed to SVOCs	No effects	Meets requirements of UAC R315-101	12,000
Excavation, off-post treatment/ disposal, and deed restrictions	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Easily implemented under current conditions	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	Reduces risk	Meets requirements of UAC R315-101	73,000
H Avenue Outfall								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
J Avenue Outfall								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
K Avenue Outfall								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
SWMU 50 COMPRESSOR CONDENSATE DRAINS								
Building 613								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
Building 619								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000

TABLE 1 (cont'd)

SWMU	Technical Evaluation							
Corrective Measures Alternative (a)	**Performance**	**Reliability**	**Implementability**	**Safety**	**Human Health Assessment**	**Environmental Assessment**	**Administrative Feasibility**	**Cost ($)**
Alternative 2: Excavation and off-post treatment/ disposal	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Easily implemented under current conditions	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	No effects	Meets requirements of UAC R315-101	26,000
SWMU 51 CHROMIC ACID/ALODINE DRYING BEDS								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
SWMU 52 POSSIBLE DRAIN FIELD/DISPOSAL TRENCHES								
Disposal Trenches (52B)								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste management, or long-term monitoring	Easily implemented under current conditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
Charcoal Material Area (52C)								
Excavation and off-post treatment/ disposal	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Easily implemented under current conditions	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	Further reduces already low risk	Meets requirements of UAC R315-101	550,000
Horse Stable Area (52D)								
Excavation and off-post treatment/ disposal	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Easily implemented under current conditions	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	Further reduces already low risk	Meets requirements of UAC R315-101	41,000
SWMU 54 SANDBLAST AREAS								
Building 604								
No action	---	---	---	---	---	---	---	---

TABLE 1 (cont'd)

SWMU	Technical Evaluation							
Corrective Measures Alternative (a)	**Performance**	**Reliability**	**Implementability**	**Safety**	**Human Health Assessment**	**Environmental Assessment**	**Administrative Feasibility**	**Cost ($)**
Building 611								
Alternative 1: Excavation, off-post treatment/ disposal, and deed restrictions	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Easily implemented under current con-ditions	Short-term risk to off-post communi-ties and onsite workers minimized by engineering and safety controls	Protects human health	Further reduces already low risk	Meets requirements of UAC R315-101 and UAC R315-101-6	120,000
Alternative 2: Excavation, soil washing, and deed restrictions	Meets identified CAOs, but pre-treatment tests are required	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill for fined grained contaminated soil	Limited number of commercial vendors experienced with soil washing	Short-term risk to off-post communi-ties and onsite workers minimized by engineering and safety controls	Protects human health	Further reduces already low risk	Meets requirements of UAC R315-101 and UAC R315-101-6; may require RCRA permit	260,000
Alternative 3: Excavation, solidi-fication/stabiliza-tion, and deed restrictions	Meets identified CAOs, but pre-treatment tests are required	Proven effective at other sites; requires no O&M, 5 year inspec-tions of stabilized soil recommended	Limited number of commercial vendors available	Short-term risk to off-post communi-ties and onsite workers minimized by engineering and safety controls	Protects human health	Further reduces already low risk	Meets requirements of UAC R315-101 and UAC R315-101-6; may require RCRA permit	210,000
Building 637								
Deed restrictions	Meets identified CAOs	Requires no O&M, waste manage-ment, or long-term monitoring	Easily implemented under current con-ditions	Not of concern	Protects human health	No effects	Meets requirements of UAC R315-101	12,000
SWMU 56 GRAVEL PIT								
Alternative 1: Deed restrictions	Does not meet identified CAOs	Requires no O&M, waste manage-ment, or long-term monitoring	Easily implemented under current con-ditions	Not of concern	Does not pro-tect human health	No effects	Does not meet requirements of UAC R315-101	12,000
Alternative 2: Excavation and off-post treatment/ disposal	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Easily implemented under current con-ditions	Short-term risk to off-post communi-ties and onsite workers minimized by engineering and safety controls	Protects human health	Reduces risk	Meets requirements of UAC R315-101	240,000

TABLE 1 (cont'd)

SWMU	Technical Evaluation							
Corrective Measures Alternative (a)	**Performance**	**Reliability**	**Implementability**	**Safety**	**Human Health Assessment**	**Environmental Assessment**	**Administrative Feasibility**	**Cost ($)**
SWMU 57 SKEET RANGE								
Alternative 1: Excavation and off-post treatment/ disposal	Meets identified CAOs	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Easily implemented under current conditions	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	Reduces ecological risk by 97 to 100%; low residual risks for vegetation and deer mouse; no unacceptable residual risks	Meets requirements of UAC R315-101 and UAC R315-101-6; lower potential for operational problems	1,400,000
Alternative 2: Excavation, soil washing, and off-post treatment/ disposal	Meets identified CAOs; offers recovery and recycling of lead shot, but pretreatment tests are required	Proven effective at other sites; requires no O&M or long-term monitoring onsite, but these activities are required at off-post landfill	Limited number of commercial vendors experienced with soil washing to remove lead shot	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	Reduces ecological risk by 97 to 100%; moderate residual risks for vegetation and deer mouse; no unacceptable residual risks	Meets requirements of UAC R315-101 and UAC R315-101-6; may require RCRA permit	1,600,000
Alternative 3: Excavation, solidification/stabilization, and off-post treatment/disposal	Meets identified CAOs, but pretreatment tests are required	Proven effective at other sites; requires no O&M, 5 year inspections of stabilized soil recommended	Limited number of commercial vendors readily available	Short-term risk to off-post communities and onsite workers minimized by engineering and safety controls	Protects human health	Reduces ecological risk by 97 to 100%; low residual risks for vegetation and deer mouse; no unacceptable residual risks	Meets requirements of UAC R315-101 and UAC R315-101-6; may require RCRA permit; administratively difficult to move treated soil off-site to another on-post location for final placement	1,500,000

(a) The recommended corrective measures alternative is shown in bold italic type.

WORD NOTEBOOK

Background: Constituent concentrations in environmental samples collected from surrounding areas not affected by site activities.

Base realignment and closure (BRAC): Program under which the U.S. Army facilitates and promotes conversion of excess Army facilities and property to private or public sector reuse.

Blood lead level: Concentration of lead in blood, usually measured in micrograms per deciliter.

Cancer risk: Increased likelihood that an individual will develop cancer as a result of site-related exposure over a 70-year lifetime.

Capital cost: Direct construction costs, such as labor and materials, plus indirect costs, such as engineering and permitting.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Established a program to identify and clean up sites where hazardous substances have been or may have been released to the environment. This Act is commonly known as Superfund.

Contaminant of concern (COC): Chemical present at levels above its numerical CAO.

Contaminant of potential concern (COPCs): Chemical present at levels above background or EPA or State guidelines. Determined during the RFI phase of the RCRA process; all COPCs were included in the human health and ecological RAs.

Corrective action: Action that physically changes the site to meet corrective action objectives. See "management measure."

Corrective action objective (CAO): Goal for protecting human health and the environment. A quantitative CAO is the numerical goal for cleanup of media (e.g., soil, water).

Corrective action permit (CAP): Specifically for TEAD, a permit issued by the State in January 1991 to address the cleanup of contaminated groundwater; required the Army to investigate the possible contamination of 39 SWMUs at TEAD.

Corrective measure: Management control or technology to clean up or minimize the migration of contaminants or to reduce exposure to humans/wildlife.

Corrective measures study (CMS): Component of the RCRA process that identifies, screens, and compares corrective measures alternatives for site-specific contamination and risk.

Covenants, Conditions, and Restrictions (CCRs): Deed restrictions on BRAC property are governed by the Declaration of Covenants, Conditions, and Restrictions for Economic Development Conveyance, November 1998. The CCRs dictate that deed restrictions are enforceable by the U.S. Government, the Redevelopment Agency of Tooele City, and the transferee, or by other designated government agencies.

Decision Document: Presents the preferred corrective measures alternatives for selected

sites; required as public participation responsibilities under RCRA.

Deed restriction: Legally binding notice in a real property deed that limits the actual use of an area; applicable to sites that are part of the BRAC program.

Ecological risk assessment (RA): Process to identify all components of the biological system at a defined site, to determine the potential effects of contaminants, and to identify possible remedies for potential problems.

Exposure point concentration (EPC): Statistically derived value representing the likely concentration that an individual is exposed to if he or she is working or living in the area of the SWMU.

Exposure scenario: Combination of an exposure pathway (i.e., release point to receptor) and receptor-specific variables (intake, contact rate, body weight, and exposure frequency).

Federal facility agreement (FFA): Legal document that describes the rules and responsibilities of the Army, EPA, and State of Utah in determining risks and providing agreed-upon corrective action.

Hazard index (HI): Likelihood of adverse health effects from exposure to chemicals that do not cause cancer. HI values less than 1.0 indicate a low likelihood; greater than 1.0, a high likelihood.

Management measure: Control such as fencing, deed restrictions, or monitoring that includes no physical removal or treatment of identified contaminants.

Media: Elements of the environment, such as soil, sediment, groundwater, surface water, and air.

Master land use plan: Plan maintained by each Federal facility that specifies land use. This document must be reviewed prior to obtaining the programming documents required for approval of new construction.

National Priority List (NPL): Established by EPA, a list that identifies sites eligible for remedial action under CERCLA. EPA has a structured program for evaluating sites and placing them on the NPL.

Noncancer health effect: Adverse health effect, other than cancer – may include weight loss or gain, organ changes, or blood chemistry changes.

Operation and maintenance (O&M) costs: Costs of annual operation and maintenance, including labor and materials.

Polycyclic aromatic hydrocarbon (PAH): Complex organic chemical compound that is a common component of exhaust, smoke, and asphalt.

Present worth: If invested at the start of a project, the amount of money that is sufficient to cover all costs (capital costs and annual O&M) over the planned life of the corrective measure.

RCRA facility investigation (RFI): Component of the RCRA process that identifies the types, amounts, and locations of contaminants.

RCRA Part B permit: Permit issued by the State for operation of hazardous waste facilities; TEAD maintains a RCRA Part B

permit for operation of the sewage lagoons and the open burn areas.

RCRA post-closure permit: Permit issued by the State that defines actions required at a closed RCRA site.

Reasonably anticipated future use: A realistic assessment of land use from a consensus of community and local planning authorities, based on federal/state land use designation, comprehensive community master plans, and zoning laws or maps.

Receptor: Human, plant, or animal at the receiving end of an exposure pathway.

Residual risk: Risk from materials or chemicals remaining onsite.

Resource Conservation and Recovery Act (RCRA): Provides a regulatory program for active sites to prevent mismanagement of hazardous solid waste.

Risk assessment (RA): Appraisal of the actual or potential effects of a hazardous waste SWMU on human health and the environment.

"Risk Rule": State of Utah regulation, "Cleanup Action and Risk-Based Closure Standards" (UAC R315-101).

Semivolatile organic compounds (SVOCs): Class of organic compounds that is analyzed as a group and is comparatively heavier (i.e., less volatile) than VOCs.

Soil washing: Engineering technique for separating fine, contaminated soil from coarse, clean soil particles.

Solidification/stabilization: Engineering technique for binding soil with a material such as cement to reduce the mobility of metals.

Solid waste management unit (SWMU): Area where hazardous substances, pollutants, and contaminants may have been disposed.

Volatile organic compound (VOC): Class of organic compounds that is analyzed as a group and is comparatively lighter (i.e., more volatile) than SVOCs.

ACRONYMS AND ABBREVIATIONS

bgs	Below ground surface
BRAC	Base Realignment and Closure
CAO	Corrective action objective
CAP	Corrective Action Permit
CCRs	Covenants, Conditions, and Restrictions
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	Corrective Measures Study
COC	Contaminant of concern
COPC	Contaminant of potential concern
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
EPC	Exposure point concentration
FFA	Federal Facility Agreement
HI	Hazard index
IWL	Industrial Waste Lagoon
LDR	Land disposal restriction
µg/dL	Microgram per deciliter
µg/g	Microgram per gram
NPL	National Priorities List
O&M	Operation and maintenance
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
RA	Risk Assessment
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SVOC	Semivolatile organic compound
SWMU	Solid waste management unit

ACRONYMS AND ABBREVIATIONS (cont'd)

TCLP	Toxicity characteristic leaching procedure
TEAD	Tooele Army Depot
TEAD-N	Tooele Army Depot - North Area
TSDF	Treatment, storage, and disposal facility
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
VOC	Volatile organic compound
yd^3	Cubic yard

GLOSSARY OF EVALUATION CRITERIA

Technical criteria

Performance – evaluates whether the corrective measures alternative can perform its intended function and meet the CAOs, including compliance with Federal, State, and local regulations. This criterion considers site and waste characteristics, and addresses the useful life of each alternative (i.e., the length of time the alternative maintains its intended level of effectiveness).

Reliability – describes the long-term effectiveness and permanence of each alternative. This criterion evaluates the adequacy of the corrective measures technology based on performance at similar sites, O&M requirements, long-term environmental monitoring needs, and residuals management measures.

Implementability – assesses the technical and institutional feasibility of executing a corrective measures alternative, including constructability, permit and legal/regulatory requirements, availability of materials, etc. This criterion also addresses the length of time from implementation of the alternative until beneficial effects are realized.

Safety – considers the potential threats to workers, nearby communities, and the environment during implementation of the corrective measure.

Human health assessment – evaluates the extent to which each alternative protects human health. This criterion considers the classes and concentrations of contaminants left onsite, potential exposure routes, and potentially affected populations. Residual contaminant concentrations are also compared to existing criteria, standards, or guidelines.

Environmental assessment – evaluates short- and long-term effects of the corrective measure on the environment, including adverse impacts to environmentally sensitive areas.

Administrative feasibility – considers compliance with applicable Federal, State, and local environmental and public health standards, requirements, criteria, or limitations.

Cost – presents capital and annual O&M costs for each corrective measures alternative. Capital costs include direct and indirect costs. Annual costs typically include labor, maintenance, energy, and sampling/analysis. For purposes of comparison, costs are presented in terms of present worth, which is the current value of a future expenditure. The cost estimates are based on conventional cost estimating guides, vendor information, and engineering judgment.

MAILING LIST

The TEAD Environmental Management Division maintains a mailing list of people interested in activities related to the Group C SWMUs. If you did not receive this Decision Document by mail and want your name added to the mailing list, or if you want your name deleted, please indicate below and mail the completed form to:

Larry McFarland/SDSTE-IRE
Environmental Management Division
Tooele Army Depot, Building T8
Tooele, UT 84074-5000

Name: _____

Affiliation (if any): _____

Address: _____

City: _____ State: ___ Zip Code:

__ Please add my name to the mailing list.

__ Please delete my name from the mailing list.

SIGNATURE AND AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVES AT SWMU 49

The selected alternatives and cost estimates for the nine areas of the Stormwater/Industrial Wastewater Piping (SWMU 49) are as follows:

- Sewer Line - Southern Area
  Deed restrictions [$12,000]

- Sewer Line - Central Area
  Deed restrictions [$12,000]

- Sewer Line - Northern Area
  Deed restrictions [$12,000]

- Building 609
  No action [$0]

- G Avenue Outfall
  Excavation, off-post treatment/disposal, and deed restrictions [$73,000]

- H Avenue Outfall
  Deed restrictions[$12,000]

- J Avenue Outfall
  Deed restrictions [$12,000]

- K Avenue Outfall
  Deed restrictions [$12,000]

The appropriate approval authority for this action is the Tooele Army Depot.

Arnold P. Montgomery LTC/OD
Commanding
Tooele Army Depot

25 Feb 02
Date

DECLARATION STATEMENT FOR SWMU 49

The selected corrective measure for the G Avenue Outfall is protective of human health and the environment, attains Federal and State requirements, and is cost effective. This corrective measure satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected corrective measure for all of the areas except Building 609 will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure. Deed restrictions will ensure continued adequate protection of human health and the environment. The selection of no action for Building 609 is protective of human health and the environment and attains Federal and State requirements because the unacceptable risks under the hypothetical future residential land use scenario derive from thallium detected below comprehensive basewide background levels.

SIGNATURE AND AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVES AT SWMU 50

The selected alternative for the Compressor Condensate Drains at Buildings 613 and 619 (SWMU 50) is deed restrictions. The total cost of this action for Buildings 613 and 619 is estimated at $12,000 each.

The appropriate approval authority for this action is the Tooele Army Depot.

Arnold P. Montgomery

Arnold P. Montgomery LTC, OD
Commanding
Tooele Army Depot

25 Feb 02
Date

DECLARATION STATEMENT FOR SWMU 50

Because this corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, deed restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURE AND AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 51

The selected alternative for the Chromic Acid/Alodine Drying Beds (SWMU 51) is deed restrictions. The total cost of this action is estimated at $12,000. The appropriate approval authority for this action is the Tooele Army Depot.

Arnold P. Montgomery LTC, OD
Commanding
Tooele Army Depot

25 Feb 02
Date

DECLARATION STATEMENT FOR SWMU 51

Because this corrective measure will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure, deed restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURE AND AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVES AT SWMU 52

The selected alternatives and cost estimates for the three areas of the Possible Drain Field/Disposal Trenches (SWMU 52) are as follows:

- 52B Disposal Trenches
Deed restrictions [$12,000]

- 52C Charcoal Material Area
Excavation and off-post treatment/disposal [$550,000]

- 52D Horse Stable Area
Excavation and off-post treatment/disposal [$41,000]

The appropriate approval authority for this action is the Tooele Army Depot.

Arnold P. Montgomery

Arnold P. Montgomery LTC, OD
Commanding
Tooele Army Depot

25 Feb 02
Date

DECLARATION STATEMENT FOR SWMU 52

The selected corrective measure for the Charcoal Material Area (SWMU 52C) and the Horse Stable Area (SWMU 52D) is protective of human health and the environment, attains Federal and State requirements, and is cost effective. This corrective measure satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected corrective measure for the Disposal Trenches (SWMU 52B) will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure. Deed restrictions will ensure continued adequate protection of human health and the environment.

SIGNATURE AND AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVES AT SWMU 54

The selected alternatives and cost estimates for the three areas of the Sandblast Areas (SWMU 54) are as follows:

- Building 604
  No action [$0]

- Building 611
  Excavation, off-post treatment/disposal,
  and deed restrictions [$120,000]

- Building 637
  Deed restrictions [$12,000]

The appropriate approval authority for this action is the Tooele Army Depot.

Arnold P. Montgomery LTC, OD
Commanding
Tooele Army Depot

25 Feb 02
Date

DECLARATION STATEMENT FOR SWMU 54

The selected corrective measure for the Sandblast Area at Building 611 is protective of human health and the environment, attains Federal and State requirements, and is cost effective. This corrective measure satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected corrective measure for Buildings 611 and 637 will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure. Deed restrictions will ensure continued adequate protection of human health and the environment. The selection of no action for Building 604 is protective of human health and the environment and attains Federal and State requirements because the unacceptable risks to future residents derive from metals detected below comprehensive basewide background levels.

SIGNATURE AND AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 56

The selected alternative for the Gravel Pit (SWMU 56) is excavation of contaminated soil and off-post treatment/disposal. The total cost is estimated at $240,000. The appropriate approval authority for this action is the Tooele Army Depot.

Arnold P. Montgomery

Arnold P. Montgomery LTC, OD
Commanding
Tooele Army Depot

25 Feb 02
Date

DECLARATION STATEMENT FOR SWMU 56

The selected corrective measure for the Gravel Pit is protective of human health and the environment, attains Federal and State requirements, and is cost effective. This corrective measure satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

SIGNATURE AND AGENCY ACCEPTANCE OF THE SELECTED ALTERNATIVE AT SWMU 57

The selected alternative for the Skeet Range (SWMU 57) is excavation of contaminated soil and off-post treatment/disposal. The total cost is estimated at $1,400,000. The appropriate approval authority for this action is the U.S. Army Materiel Command.

Arnold P. Montgomery

Arnold P. Montgomery LTC, OD
Commanding
Tooele Army Depot

25 Feb 02
Date

DECLARATION STATEMENT FOR SWMU 57

The selected corrective measure for the Skeet Range is protective of human health and the environment, attains Federal and State requirements, and is cost effective. This corrective measure satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.