Nevada
Environmental
Restoration
Project

DOE/NV--940

Corrective Action Decision Document/Closure Report for Corrective Action Unit 410: Waste Disposal Trenches, Tonopah Test Range, Nevada

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**CORRECTIVE ACTION DECISION
DOCUMENT/CLOSURE REPORT FOR
CORRECTIVE ACTION UNIT 410:
WASTE DISPOSAL TRENCHES,
TONOPAH TEST RANGE, NEVADA**

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Las Vegas, Nevada

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**CORRECTIVE ACTION DECISION DOCUMENT/CLOSURE REPORT FOR
CORRECTIVE ACTION UNIT 410: WASTE DISPOSAL TRENCHES,
TONOPAH TEST RANGE, NEVADA**

Approved by: _____ Date: _____

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List of Acronyms and Abbreviations

bgs	Below ground surface
BMP	Best management practice
CADD	Corrective Action Decision Document
CAI	Corrective Action Investigation
CAIP	Corrective Action Investigation Plan
CAS	Corrective Action Site
CAU	Corrective Action Unit
CFR	<i>Code of Federal Regulations</i>
CLP	Contract Laboratory Program
COC	Contaminant of concern
COPC	Contaminant of potential concern
CR	Closure Report
CRDL	Contract-required detection limit
CSM	Conceptual site model
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DQO	Data quality objective
DQI	Data quality indicators
DRO	Diesel-range organics
DU	Depleted uranium
EOD	Explosives ordnance disposal
EPA	U.S. Environmental Protection Agency
EZ	Exclusion Zone
FADL	Field Activity Daily Log
FD	Field duplicate
FFACO	<i>Federal Facility Agreement and Consent Order</i>

List of Acronyms and Abbreviations (Continued)

FSL	Field-screening level
FSR	Field-screening result
ft	Foot (feet)
ft ²	Square feet
ft ³	Cubic feet
yd ³	Cubic yard
GPS	Global positioning system
GRO	Gasoline-range organics
HE	High explosives
HSA	Hollow-stem auger
HWAA	Hazardous waste accumulation area
ICP	Inductively coupled plasma
IDW	Investigation-derived waste
in.	Inch(es)
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
lb	Pound
LLW	Low-level radioactive waste
MDC	Minimum detectable concentration
MDL	Method detection limit
mg/kg	Milligram per kilogram
mi	Mile
mm	Millimeter
MRL	Minimum reporting limit
MS/MSD	Matrix spike/matrix spike duplicate
NDEP	Nevada Division of Environmental Protection

List of Acronyms and Abbreviations (Continued)

NEDS	Non-violent Explosive Destruct System
NIST	National Institute for Standards and Technology
NNSA/NSO	U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office
NTS	Nevada Test Site
NTSWAC	Nevada Test Site Waste Acceptance Criteria
PAL	Preliminary action level
PB	Preparation
PCB	Polychlorinated biphenyls
pCi/g	Picocurie per gram
PID	Photoionization detector
PPE	Personal protective equipment
ppm	Part per million
PRG	Preliminary Remediation Goals
Pu	Plutonium
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RCA	Radiological Contamination Area
RCRA	<i>Resource Conservation and Recovery Act</i>
RDX	Royal Demolition Explosive
RMA	Radioactive Materials Area
ROTC	Record of Technical Change
RPD	Relative percent difference
RWMS	Radioactive Waste Management Site
SAA	Satellite Accumulation Area
SDG	Sample delivery group

List of Acronyms and Abbreviations (Continued)

Shaw	Shaw Environmental and Infrastructure, Inc.
SNL/NM	Sandia National Laboratories
SVOC	Semivolatile organic compound
TPH	Total petroleum hydrocarbons
TPU	Total propagated uncertainties
TSCA	<i>Toxic Substance Control Act</i>
TTR	Tonopah Test Range
U	Uranium
USAF	U.S. Air Force
UXO	Unexploded ordnance
VOC	Volatile organic compound
WM	Waste Management
%R	Percent recovery
µg/kg	Micrograms per kilograms

Executive Summary

This Corrective Action Decision Document/Closure Report (CADD/CR) presents information supporting the recommendation of no further action for Corrective Action Unit (CAU) 410: Waste Disposal Trenches, Tonopah Test Range (TTR), Nevada. This CADD/CR complies with the requirements of the *Federal Facility Agreement and Consent Order* (1996) that was agreed to by the State of Nevada, the U.S. Department of Energy, and the U.S. Department of Defense. Corrective Action Unit 410 is located at the TTR, which is included in the Nevada Test and Training Range (formerly called the Nellis Air Force Range), and is approximately 235 miles northwest of Las Vegas, Nevada.

Corrective Action Unit 410 is located in Area 3, Area 9, south Antelope Lake, and the northern area of the Nonviolent Explosive Destruct System (NEDS) Lake of the TTR. The five Corrective Action Sites (CASs) that comprise CAU 410 are as follows:

- TA-21-003-TANL, Disposal Trench
- 09-21-001-TA09, Disposal Trenches
- TA-19-002-TAB2, Debris Mound
- TA-21-002-TAAL, Disposal Trench
- 03-19-001, Waste Disposal Site

From October 29 through November 7, 2002, initial investigation activities were conducted on all five CASs. Supplemental field activities were conducted March 3 through October 22, 2003, on CASs TA-19-002-TAB2, TA-21-002-TAAL, and 03-19-001. Corrective action investigation activities were performed as set forth in the *Corrective Action Investigation Plan for Corrective Action Unit 410: Waste Disposal Trenches, Tonopah Test Range, Nevada* (NNSA/NV, 2002a), and ROTCs No. 1 through No. 4. The purposes of the activities as defined during the data quality objectives process were:

- Determine if contaminants of concern (COCs) are present.
- If COCs are present, determine their nature and extent.
- Provide sufficient information and data to complete appropriate corrective actions for the CASs.

Analytes detected during the corrective action investigation activities were evaluated against preliminary action levels (PALs) to determine the COCs for CAU 410. Assessment of the data generated from these activities indicate the PALs were exceeded for isotopic uranium at CASs TA-19-002-TAB2 and TA-21-002-TAAL and total petroleum hydrocarbons at CAS 03-19-001. However, the nature of the supplemental field investigation on these three CASs (i.e., excavation, segregation, and separation of soil, debris, and/or unexploded ordnance [UXO] to determine nature and extent) resulted in each CAS being free of contamination greater than PALs (based on verification samples) and free of waste/debris and UXO after the characterization activities. Initial investigation results for the remaining two CASs (TA-21-002-TANL and 09-21-001-TA09) indicate no PALs were exceeded. The concentrations of arsenic detected in CAU 410 soils are considered representative of ambient conditions at the TTR (NMBG, 1998; Moore, 1999; SNL, 1999); therefore, no corrective action is necessary for the soil containing arsenic.

The purpose of this CADD/CR is to provide justification and documentation supporting the recommendation for closure of CAU 410 with no further corrective action. To achieve this, the following actions were performed:

- Initial field activities detailed in the corrective action investigation plan (CAIP) (NNSA/NV, 2002a) were conducted from October 28 through November 7, 2002.
- Based on the results of the initial field activities, supplemental field activities detailed in Records of Technical Change (ROTCs) No. 1 through No. 4 of the CAIP (NNSA/NV, 2002a) were conducted between March 3 and October 22, 2003.
- The current site conditions and the nature and extent of contamination were reviewed upon the completion of the supplemental field activities.
- All UXO, soil, and waste debris was disposed of in accordance with the CAIP (NNSA/NV, 2002a), associated ROTCs, and applicable regulations.
- The closure of CAU 410 was documented.

Results from the supplemental field activities associated with the removal of depleted uranium contaminated waste and UXO at CASs TA-19-002-TAB2 and TA-21-002-TAAL, and removal of hydrocarbon waste at CAS 03-19-001, indicate that no further corrective action is necessary for these CASs. Results from the initial investigation of TA-21-002-TANL and 09-21-001-TA09 indicate no contamination in excess of PALs is present. Therefore, no further action is necessary at these CASs.

No use restrictions are required to be placed on this CAU because the investigation showed no evidence of remaining soil contamination or remaining debris/waste upon completion of all investigation activities. Therefore, the U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office (NNSA/NSO) provides the following recommendations:

- No further corrective action is required at CAU 410.
- No Corrective Action Plan is required.
- A Notice of Completion to NNSA/NSO is requested from the Nevada Division of Environmental Protection for closure of CAU 410.
- Corrective Action Unit 410 should be moved from Appendix III to Appendix IV of the *Federal Facility Agreement and Consent Order*.

1.0 Introduction

This Corrective Action Decision Document/Closure Report (CADD/CR) has been prepared for Corrective Action Unit (CAU) 410: Waste Disposal Trenches, Tonopah Test Range (TTR), Nevada, in accordance with the *Federal Facility Agreement and Consent Order* (FFACO) that was agreed to by the State of Nevada, the U.S. Department of Energy (DOE), and the U.S Department of Defense (FFACO, 1996).

The TTR, which is included in the Nevada Test and Training Range (formerly called the Nellis Air Force Range), is approximately 235 miles (mi) northwest of Las Vegas, Nevada ([Figure 1-1](#)). Corrective Action Unit 410 is located in Area 3, Area 9, south Antelope Lake, and the northern area of the Nonviolent Explosive Destruct System (NEDS) Lake at the TTR ([Figure 1-2](#)). The CAU contains five correction action sites (CASs). All were investigated in accordance with the Corrective Action Investigation Plan (CAIP) (NNSA/NV, 2002a). [Table 1-1](#) lists the five CASs investigated and their associated facilities.

Table 1-1
CAU 410 Corrective Action Sites and Associated Facilities

Location	CAS Number	CAS Description	Facility Association
NEDS Lake	TA-21-003-TANL	Disposal Trench	NEDS Lake
Area 9	09-21-001-TA09	Disposal Trenches	Area 9
NEDS Lake	TA-19-002-TAB2	Debris Mound	Bunker 2
Antelope Lake	TA-21-002-TAAL	Disposal Trench	Antelope Lake (southern end)
Area 3	03-19-001	Waste Disposal Site	Area 3, Building 0385

The CADD and CR have been combined into one report because no further action is recommended for this CAU. The CADD/CR provides or references the specific information necessary to support this recommendation.

Figure 1-1
Tonopah Test Range Location Map

Figure 1-2
TTR CAU 410 CAS Location Map

1.1 Purpose

The Waste Disposal Trenches included in CAU 410 were historically used for disposal of miscellaneous waste debris and ordnance waste. In addition, two of the five sites have associated depleted uranium (DU)-contaminated soil and debris. Other contaminants associated with the sites include total petroleum hydrocarbons (TPH). The CAIP for *Corrective Action Unit 410: Waste Disposal Trenches Tonopah Test Range, Nevada* (NNSA/NV, 2002a), provides additional information relating to the history, planning, and scope of the investigation; therefore, it will not be repeated in this CADD/CR.

The purpose of this CADD/CR is to provide justification for the closure of CAU 410 without further corrective action. This justification is based on process knowledge and the results of the investigative activities conducted in accordance with the CAIP (NNSA/NV, 2002a) and the corresponding Record of Technical Changes (ROTCs).

No further action is appropriate because all necessary conditions for closure of the CAU have been met as a result of the activities associated with the supplemental field investigation. The nature of the supplemental field investigation on three of the CASs (i.e., excavation, segregation, and separation of soil, debris, and/or unexploded ordnance [UXO] to determine nature and extent) resulted in each CAS being free of contamination greater than Preliminary Action Level (PAL) concentrations and free of waste/debris or UXO. As there is no contamination greater than PALs remaining at any of the CASs, no risk assessment is required.

1.2 Scope

The scope of this CADD/CR is to justify and recommend that no further corrective action is required at CAU 410. To achieve this scope, the following actions were implemented:

- Initial field activities detailed in the CAIP (NNSA/NV, 2002a) were conducted from October 28 through November 7, 2002.
- Based on the results of the initial field activities, supplemental field activities detailed in ROTCs No.1 through No. 4 of the CAIP (NNSA/NV, 2002a) were conducted between March 3 and October 22, 2003.

- Current site conditions and the nature and extent of contamination were reviewed upon the completion of the supplemental field activities.
- A Notice of Completion was documented for closure of CAU 410.
- All UXO, soil, and waste debris were disposed of in accordance with the appropriate ROTCs, CAIP (NNSA/NV, 2002a), and applicable regulations.

1.3 CADD/CR Contents

This CADD/CR is divided into the following sections:

[Section 1.0](#) - Introduction: summarizes the purpose, scope, and contents of this CADD/CR.

[Section 2.0](#) - Corrective Action Investigation Summary: summarizes the investigation field activities, the results of the investigation, and the justification for no further action.

[Section 3.0](#) - Recommendation: recommends no further corrective action and closure of CAU 410.

[Section 4.0](#) - References: provides a list of all referenced documents.

[Appendix A](#) - *Corrective Action Investigation Results for CAU 410: Waste Disposal Trenches, Tonopah Test Range, Nevada*: provides a description of the project objectives, field investigation and sampling activities, investigation results, waste management, and quality assurance.

[Section A.3.0](#) through [Section A.7.0](#) provide CAS-specific information regarding field activities, sampling methods, and laboratory analytical results from the investigation.

[Appendix B](#) - *Data Assessment for CAU 410*: summarizes the investigation results as they meet the requirements set forth during the data quality assessment process.

[Appendix C](#) - *Risk Assessment for CAU 410: Waste Disposal Trenches, Tonopah Test Range, Nevada*: summarizes the risk assessment results.

[Appendix D](#) - *Closure Activities and Waste Disposition for CAU 410*: summarizes the closure activities, waste management activities, and the verification sampling activities and results.

[Appendix E](#) - *Waste Manifests for CAU 410*: provides the copies of waste manifests generated during disposal activities.

[Appendix F](#) - *Nevada Division of Environmental Protection (NDEP) Comment Responses*: contains responses to NDEP comments on the Draft CADD.

1.3.1 Supporting Documentation

All work was performed in accordance with the following documents:

- *Corrective Action Investigation Plan for Corrective Action Unit 410: Waste Disposal Trenches, Tonopah Test Range, Nevada* (NNSA/NV, 2002a)
- *Industrial Sites Quality Assurance Project Plan* (QAPP) (NNSA/NV, 2002b)
- *Federal Facility Agreement and Consent Order* (1996)
- *Project Management Plan* (DOE/NV, 1994)

To address the preliminary findings of the CAU 410 investigations conducted in October and November 2002, the following ROTCs were completed to allow for supplemental field activities to be completed:

- The February 19, 2003, ROTC No. 1 to the CAIP outlined the proposed removal of contaminated soil from CAS 03-19-001, Waste Disposal Site.
- The February 19, 2003, ROTC No. 2 to the CAIP outlined the proposed removal of contaminated soil and debris from CAS TA-19-002-TAB2, Debris Mound, and the removal of debris from CAS TA-21-002-TAAL, Disposal Trench (i.e., Antelope Lake).
- The March 10, 2003, ROTC No. 3 to the CAIP outlined the proposed removal of additional contaminated soil from CAS 03-19-001, Waste Disposal Site, at depths greater than identified in ROTC No. 1.
- The April 21, 2003, ROTC No. 4 to the CAIP outlined the removal of UXO and ordnance debris from CAS TA-19-002-TAB2, Debris Mound, and the removal of debris from CAS TA-21-002-TAAL, Disposal Trench (i.e., SW Antelope Lake).

- The March 14, 2003, ROTC No. 1 to the Field Management Plan for Corrective Action Unit 410: Waste Disposal Trenches, Tonopah Test Range, Nevada, provided guidance for supplemental field activities.

1.3.2 Data Quality Objectives

The Data Quality Objectives (DQOs) identified in the CAIP are as follows:

- Determine if contaminants of concern (COCs) are present.
- If COCs are present, determine their nature and extent.

The Data Quality Indicators (DQIs) as discussed in [Appendix B](#), were achieved. The DQOs, established in the CAIP, were met. Excavation activities conducted to define the nature and extent of contaminants of potential concern (COPCs) resulted in the removal of contamination above PALs at these CASs; therefore, no risk assessment is required for CAU 410.

2.0 Corrective Action Investigation Summary

The following section summarizes the CAU 410 investigation activities, investigation results, and presents the justification for no further action. For detailed investigation activities and results, refer to [Appendix A](#). Refer to [Appendix D](#) for detailed closure-type activities that resulted from best management practices implemented during supplemental field activities.

2.1 Investigation Activities

The initial field activities as set forth in the CAIP (NNSA/NV, 2002a) were performed from October 28 through November 7, 2002. The supplemental field activities were performed as set forth in the four ROTCs from March 3 through October 22, 2003. The activities at all CASs include:

- Prefield activities, including debris removal, construction of hazardous waste accumulation areas (HWAAs), utility clearances
- UXO surveys
- Radiological walk-over surveys
- Collecting waste management samples
- Collecting biased surface and subsurface soil samples, and subsequent laboratory analysis, to define the lateral and vertical extent of COCs
- Conducting discrete field screening of select samples for characterization and health and safety purposes
- Collecting Global Positioning System (GPS) coordinates of sampling locations
- Collecting select GPS coordinates to define the limits of work areas at select CASs

The following sections summarize the activities at each CAS (see [Appendix A](#) for additional details).

2.1.1 CAS TA-21-003-TANL, Disposal Trench

Investigation activities conducted in October 2002 consisted of one trench excavated through the center of the depression to a depth of about 2 feet (ft) below ground surface (bgs) (see [Figure A.5-1](#)). The eastern end of the existing depression was excavated to investigate an anomaly identified during the 2002 geophysical survey (Shaw, 2002). Excavation of this anomaly revealed an empty tin can with no apparent staining or elevated radiological screening measurements.

Since no biasing factors were encountered (i.e., elevated field-screening results [FSRs]), two soil samples were collected from the native-soil interface in accordance with the CAIP. The first sampling location (410NL001) was approximately 4 to 4.5 ft below the original ground surface on the western end of the depression within the excavated trench. Sample 410NL002 and duplicate 410NL003 were collected from the native soil interface beneath the tin can. The excavation trench was backfilled and no further activities were conducted at this CAS. Based on investigation results, the conceptual site model (CSM) was valid.

2.1.2 CAS 09-21-001-TA09, Disposal Trenches

No buried debris was identified during the geophysical surveys; therefore, in accordance with the CAIP, surface samples were collected from low spots within the CAS. Surface sample 41009001 was collected from the western end of the CAS, and surface sample 41009002 and duplicate sample 41009003 were collected from the eastern end of the CAS. During the sampling activities, which were conducted with a hand auger, native soils consisting of cemented caliche were encountered. Since native soils were encountered at the two sampling locations and there was no apparent staining or debris, no additional sampling was conducted at this location. Based on investigation results the CSM was valid.

2.1.3 CAS TA-19-002-TAB2, Debris Mound (Bunker Site)

During the CAU investigation activities conducted in October and November 2002 at CAS TA-19-002-TAB2, the initial excavation at the site confirmed the presence of subsurface debris at the mound area. The debris material appeared to be confined to the mound area and within the limits of a buried metal pan (approximately 10 by 15 ft). The metal pan had an open top and a

height of approximately 12 to 18 inches (in.). The pan held materials such as soil, metal posts, UXO, drogue chutes, explosives containers, and miscellaneous debris. Due to size of the metal pan and the inability to move the metal object, the vertical extent of the debris and potentially contaminated material could not be determined. A total of six samples were collected during the initial investigation. Analytical results, as well as radiological field screening, confirmed that DU was present above PALs on the debris and in the soil contained within the metal pan.

In accordance with the ROTC No. 2 to the CAIP, further excavation activities were conducted in March 2003 to remove contaminated soil, debris, and the metal-pan in order to expose subsurface soils to define vertical extent of potential contamination. These excavation activities included the segregation and screening of DU-impacted soil and debris from ordnance. The excavation activities were completed on March 27, 2003, and six confirmation samples were collected from the sidewalls and floor of the excavation. Two east sidewall samples (410B2009 and 410B2013) collected in March and September, respectively, indicated DU still remained in the soil above PALs. The eastern sidewall had been the location of extensive excavation, removal, and waste loading of contaminated materials during supplemental field activities. Additional soil was removed on October 14, 2003, to define the lateral extent of the DU and the sidewall was resampled (410B2024). The analytical results indicate the remaining soil is below PALs and the lateral extent of DU on the east sidewall is defined. Based on investigation results, the CSM was valid.

Supplemental field activities included loading DU-impacted soil and debris into waste containers for disposal and the collection of verification samples of the ground surface. A portion of the DU waste was loaded in March 2003 with the remaining waste stockpiled until September 2003. At that time, the remaining waste was loaded. Initial verification samples collected from the former DU-waste stockpile staging area in September 2003 indicated concentrations of DU above the PAL remained on the surface (sample 410B2014). Additional soil was removed on October 14, 2003, and another nine verification samples (410B2016 to 410B2024) were collected from the former staging area and submitted to the off-site laboratory for isotopic uranium analysis. Analytical results confirmed that the remaining soil is below the action level for DU, except for one grid area on the west side of the former stockpile (410B2021). Additional soil was removed from the grid section on October 22, 2003, and one sample (410B2034) was collected. Analytical results confirm the soil is below the PAL.

The DU-waste containers loaded in March and September 2003 were transported to the Area 3 and Area 5 Radioactive Waste Management Sites (RWMS) at the Nevada Test Site (NTS) for disposal. The additional soil removed on October 14 and October 22, 2003, was drummed and disposed of at the U10C disposal site at the NTS. The excavation was backfilled with native soil from the TTR borrow pit.

In addition to DU-impacted soil and debris, UXO was encountered within the contents of the metal pan. A total of 132 cluster bomb submunitions and one fuze were identified and segregated from the rest of the debris. The U.S. Air Force (USAF) explosive ordnance disposal (EOD) personnel inspected the cluster bomb submunitions and determined they were inert. Of the 132 cluster bomb submunitions, 35 were contaminated with DU. The 97 cluster bomb submunitions not contaminated were moved to the USAF recycle pile located on range. The remaining 35 were demilitarized by USAF EOD personnel and Shaw Environmental, Inc. (Shaw) UXO personnel to qualify for final disposition into the low-level radioactive waste (LLW) landfill. These activities were conducted in accordance with the ROTC No. 4 to the CAIP, which outlined the removal of UXO and ordnance debris from CAS TA-19-002-TAB2, Debris Mound. A summary of the final disposition of all ordnance uncovered during all CAU investigation activities is presented in [Appendix D](#).

2.1.4 CAS TA-21-002-TAAL, Disposal Trench (Antelope Lake)

During the initial CAU investigation activities conducted in November 2002, the excavation activities did not define the horizontal and vertical extent of the debris due to the nature of the materials and the limited capability of the equipment. The buried debris, which consisted of a variety of material including metallic debris, UXO, and steel wire, was greater in vertical and lateral extent than suggested by geophysical surveys and process knowledge. At the completion of this initial phase, two soil samples were collected from the southern and northern trenches and submitted for laboratory analyses.

Based on the information gathered during the initial investigation, ROTC No. 2 to the CAIP proposed additional excavation be completed as a supplemental field activity to the CAIP/DQO process. The supplemental activities focused on the excavation; segregation; and separation of soil,

debris, and UXO while defining the nature and extent of potential contamination in subsurface soils. The additional excavation activities commenced on March 11, 2003, and were completed on March 20, 2003. During these excavation activities, the soils in the excavation were field screened for high explosives (HE) and radiological constituents. Field-screening results indicated that Royal Demolition Explosive (RDX) was not above the field-screening levels (FSLs) in the soils. Therefore, the limits of the excavation were defined by the presence of UXO and debris. On the northern portion of the excavation, elevated radiological field-screening results (FSRs) indicated the presence of DU on soils and debris. Excavation of the waste disposal trenches continued to define the extent of DU contamination after implementing the necessary hazard controls (i.e., radiological work permit). As the excavation progressed, a total of 13 soil characterization samples were collected to confirm that the boundaries of the excavation were not impacted by the COPCs and that further excavation was not warranted. The final dimensions of the excavation to define lateral and vertical extent were approximately 100 by 70 ft. The vertical depths of the excavation ranged from 14 ft on the eastern side to less than 5 ft on the western side. Based on investigation results, the CSM was valid.

The detection of DU warranted further segregation of the soils, debris, and UXO to isolate the DU-impacted material from nonimpacted material. Supplemental field activities included the loading of DU-impacted soil and debris into containers for disposal. The disposal activities, along with the collection of samples for waste characterization are detailed in [Appendix D](#). Initial surface verification samples collected from the former DU-waste stockpile staging areas in September 2003 indicated concentrations of DU above the PAL remained on site (410AL018). Additional soil was removed on October 14, 2003, and another nine verification samples were collected and submitted to an off-site laboratory for isotopic uranium analysis (410AL021 to 410AL029). Analytical results confirmed that the remaining soil is below the action level for DU.

In addition to nonhazardous and DU-impacted materials, over 1,000 pieces of UXO were identified. The initial screening and segregation of UXO was conducted as the soil was first excavated and stockpiled. Upon subsequent visual inspections of the soil stockpiles Nos. 1, 2, 4, and the DU-waste stockpile, it was discovered that additional UXO still remained in these stockpiles. Between June and September 2003 these soil stockpiles were rescreened through a more refined process to identify and properly segregate additional UXO. All UXO recovered from the

excavation were segregated and properly disposed by either demilitarization or scrap recycling between the months of March through September 2003. The UXO contaminated with DU were demilitarized by USAF EOD and Shaw UXO personnel to qualify for final disposition to the LLW landfill at the NTS. Any uncontaminated UXO determined inert by the USAF EOD personnel were moved to the USAF recycle pile on range. These activities were conducted in accordance with the ROTC No. 4 to the CAIP, which outlined the removal of UXO and ordnance debris from CAS TA-21-002-TAAL, Disposal Trench. The number and various types of ordnance, and their final disposition, are presented in [Appendix D](#).

All DU waste that was loaded into approved containers during September 2003 was transported for disposal at the Area 3 and Area 5 RWMSs at the NTS. The additional soil removed on October 14, 2003 was drummed and disposed of at the U10C disposal site at the NTS. Nonhazardous waste that was excavated, segregated, and stockpiled was loaded into haul trucks and disposed at the TTR construction landfill. The excavation was backfilled with native soil from the TTR borrow pit.

2.1.5 CAS 03-19-001, Waste Disposal Site

During the October 2002 investigation, a trench was excavated approximately 12 to 15 ft south of the original SWS-4 sample location where FSLs were exceeded for TPH-diesel-range organics (DRO) during the CAU 405 investigation. Five soil samples were collected from the locations designated in the CAIP. Neither debris nor stained soil were observed in the sides and/or bottom of the trench, and TPH field screening indicated no contamination. The five samples collected confirmed the absence of TPH within the excavation.

As a best management practice, it was decided to excavate the TPH-contaminated soil and burned debris encountered at the CAU 405 SWS-4 location based on the assumption that contamination was restricted to the immediate vicinity at a depth of 4.5 to 5.5 ft bgs. Therefore, ROTC No. 1 to the CAIP was approved for supplemental field activities to include excavation, segregation, and separation of debris and soil based on FSRs and visual observation of staining.

The supplemental field activities were conducted under ROTCs No. 1 and No. 3 between March and May 2003. Investigation results under ROTC No. 1 indicated debris and staining to greater

depths and lateral extent than anticipated. Excavation to determine the nature and extent of potential TPH contamination continued under ROTC No. 3. Various investigation tools such as exploratory potholes, hollow-stem auger drilling, and excavation were used to remove all of the debris from the burn pit area. Because previous sampling of the stained soil indicated TPH was not associated with debris/staining within the burn pit area, only photoionization detector (PID) field screening was implemented for sample selection. During these supplemental activities, a distinct area of TPH soil contamination above the NDEP action levels (100 milligrams per kilogram [mg/kg]) (NAC, 2002) was encountered at the southern end of the burn pit. This TPH area was treated as a separate investigation area for the purposes of field screening, sample collection, and waste segregation. A series of verification soil samples were collected between March and May 2003 for both the burn pit and TPH areas. The samples were submitted for off-site laboratory analysis of COPCs. Analytical results confirm remaining soil is below PALs. Based on investigation results, the CSM was valid.

The nature and extent of the burned debris, soil staining, and TPH-contaminated soil was characterized and defined by sample collection and analysis. The excavated materials were separated and segregated for proper disposal. The TPH contamination was removed for disposal at the Area 6 hydrocarbon disposal site at the NTS. Nonimpacted waste was disposed at the TTR construction landfill. The excavation was backfilled with native soil from the TTR borrow pit.

2.2 Results

Summary characterization data from the corrective action investigation are provided in [Section 2.2.1](#). This information illustrates the degree of characterization accomplished through the investigation and identifies those COPCs that exceeded PALs as COCs. [Section 2.2.2](#) summarizes the assessment made in [Appendix B](#), which demonstrates the correlation between the investigation results and the DQOs.

2.2.1 Summary of Analytical Data

Chemical and radiological results for characterization samples in each of the CASs are summarized in [Section 2.2.1.1](#) through [Section 2.2.1.5](#). The PALs for the CAU 410 investigation were

determined during the DQO process and are discussed in Section 3.3 of the CAIP (NNSA/NV, 2002).

2.2.1.1 CAS TA-21-003-TANL, Disposal Trench

The analytical results for soil samples collected at TA-21-003-TANL indicated that COCs are not present in the soil at this site. The soil samples were submitted for the following analysis: total volatile organic compounds (VOCs), total semivolatile organic compounds (SVOCs), total *Resource Conservation and Recovery Act* (RCRA) metals, HE, total beryllium, gamma spectrometry, TPH-DRO and gasoline-range organics (GRO), isotopic uranium (U), and isotopic plutonium.

2.2.1.2 CAS 09-21-001-TA09, Disposal Trench

The analytical results for soil samples collected at 09-21-001-TA09 indicated that COCs are not present in the soil at this site. The soil samples were submitted for the following analysis: total VOCs, total SVOCs, total RCRA metals, HE, and gamma spectrometry.

2.2.1.3 CAS TA-19-002-TAB2, Debris Mound

The analytical results for the final verification soil samples collected at TA-19-002-TAB2 during supplemental field activities indicate that COCs are not present in the soil at this site. Site characterization samples collected during the initial October and November 2002 investigation were compared to PALs for the following parameters: total VOCs, total SVOCs, total RCRA metals, HE, gamma spectrometry, and isotopic uranium. Subsequent to the supplemental excavation activities conducted in March 2003 to determine extent of contamination, verification samples were compared to PALs for the following parameters: total VOCs, total SVOCs, total RCRA metals, HE, total beryllium, gamma spectrometry, TPH-DRO and -GRO, polychlorinated biphenyls (PCBs), pesticides, herbicides, isotopic uranium, and isotopic plutonium. Following the additional soil removal activities in September and October 2003, verification samples were compared to PALs for isotopic uranium and/or PCBs.

Although bismuth-212, thorium-234, U-234, U-235, and U-238 were detected in several verification soil samples at concentrations exceeding PALs, a normalized difference test determined these results are statistically indistinguishable from the PAL; therefore, are not considered COCs (Alderson, 2003). However, samples 410B2009 and 410B2013 (eastern sidewall of the excavation) and 410B2014 (former stockpile area) were statistically higher than the PAL for U-235 and U-238, prompting additional soil removal from the eastern sidewall and former stockpile area. Soil was excavated and removed by hand on October 14, 2003, and eight additional verification samples analyzed for isotopic uranium (410B2016 through 410B2024). After applying the normalized difference test, one of these samples (410B2021) was determined to exceed the PAL. Additional soil was removed and one sample (410B2034) collected on October 22, 2003. This most recent analytical result indicates uranium concentrations in the remaining soil are below PALs.

2.2.1.4 CAS TA-21-002-TAAL, Disposal Trench

The analytical results for investigation/verification soil samples collected at TA-21-002-TAAL indicated that COCs are not present in the soil at this site. Investigation and verification soil samples from both the initial and supplemental investigations were submitted for the following analysis: total VOCs, total SVOCs, total RCRA metals, HE, total beryllium, gamma spectrometry, TPH-DRO and -GRO, isotopic uranium, and isotopic plutonium. The only exception is for verification samples 410AL017 to 410AL029, which were only analyzed for isotopic uranium.

Bismuth-212, thorium-234, U-234, U-235, and U-238 were detected in several confirmation/verification soil samples at concentrations exceeding PALs. A normalized difference test was performed on these samples which determined the results are statistically indistinguishable from the PAL; therefore, they are not considered COCs (Alderson, 2003). However, sample 410AL018 (former DU-stockpile area) was statistically higher than the PAL for U-235 and U-238, prompting additional soil removal from the former DU-stockpile staging areas. Soil was excavated and removed by hand on October 14, 2003, and eight additional verification samples were collected and analyzed for isotopic uranium (410AL021 to 410AL029). Statistical analysis of these most recent analytical results indicate uranium concentrations in the remaining soil are below PALs.

Arsenic was detected above the background PAL of 23 mg/kg in several soil samples collected at this CAS. Arsenic concentrations in samples range from 8.5 to 34 mg/kg. However, this is consistent with the background concentration range from 6 to 43 mg/kg in soils from locations near the TTR (SNL, 1999). Arsenic concentrations exceeded the PAL, but are considered representative of ambient conditions at the site; therefore, arsenic is not considered to be a COC for soil at this CAS.

2.2.1.5 CAS 03-19-001, Waste Disposal Site

The analytical results for soil samples collected at CAS 03-19-001 indicated the only COC present in the soil at this site was TPH-DRO (soil samples 41003009 and 41003015). These soil samples were collected to characterize soils remaining in the TPH excavation and represent soils that were subsequently removed by excavation and disposed while determining lateral and vertical extent of contamination. Verification samples collected on sidewalls and the floor of both the TPH-excavation and the burn-pit excavation, indicate that remaining subsurface soils are below the NDEP action level of 100 mg/kg (NAC, 2002). The analytical results were compared to PALs for the following parameters during the initial October/November 2002 investigation: TPH-DRO. The analytical results for samples collected during the supplemental field activities conducted in March and April 2003 were compared to PALs for multiple combinations of the following parameters: total VOCs, total SVOCs, total RCRA metals, HE, total beryllium, gamma spectrometry, TPH-DRO and -GRO, PCBs, pesticides, herbicides, isotopic uranium, and isotopic plutonium.

2.2.2 Summary of Data Assessment

An assessment of CAU 410 corrective action investigation results was performed to determine whether the data collected met the DQOs and could support their intended use in the decision-making process. The data assessment, provided in [Appendix B](#), includes an evaluation of the DQIs to determine the degree of acceptability and usability of the reported data in the decision-making process. Additionally, a reconciliation of the data with the CSM established for this project was conducted. Conclusions were validated based on the results of the quality assurance (QA)/quality control (QC) measurements provided in [Appendix B](#) and discussed in [Section A.8.0 of Appendix A](#).

The overall results of the assessment indicate that the DQI goals for precision, accuracy, completeness, representativeness, and comparability have been achieved. Precision and accuracy of the data sets were demonstrated to be high. Evaluation of completeness indicates that sufficient information was collected to support decisions and to meet the DQOs. Representativeness of site characteristics was demonstrated with the CAU 410 data. An evaluation of comparability provides a high confidence that the data sets for the project are comparable to all other data sets generated by accepted industry standard practices (e.g., EPA SW-846). Meeting DQI goals supports acceptance of the CAU 410 data sets for meeting the DQOs established for this project and the subsequent use of this data in the decision-making process.

The CSM presented in the CAU 410 CAIP and the four ROTCs was the basis for the sample collection designs used for the site investigation. If information generated during the investigation had required a significant change in the CSM, the sampling design may not have been adequate to meet the DQOs. The reconciliation of CAU 410 corrective action investigation results to the established CSM supports the assumptions documented in the model and demonstrates completeness, representativeness, and comparability. The sampling configuration generated sufficient information to support the corrective action decision presented in [Section 2.3](#).

2.3 *Justification for No Further Action*

Analytes detected in soil during the corrective action investigation were evaluated against PALs to determine the COCs for each CAS in CAU 410. Initial (October/November 2002) analytical results for CASs TA-21-003-TANL and 09-21-001-TA09 did not exceed PALs. Therefore, no further action was deemed necessary for the soil at these two CASs. Initial excavation and analytical results (October/November 2002) for the remaining three CASs (TA-19-002-TAB2, TA-21-002-TAAL, and 03-19-001) indicated the need for supplemental corrective action investigation activities to properly define the nature and extent of contamination. These supplemental activities were conducted March 3 to October 22, 2003, and consisted of excavating all materials for segregation and separation (i.e., soil, debris) and disposal followed by verification sampling.

As best management practice (BMP), closure-type activities were performed at the three CASs requiring supplemental field activities. These BMP activities were performed March 10 through October 22, 2003. Refer to [Appendix D](#) for a more detailed description of the BMP (closure activities), verifications samples, and waste disposition. The closure-type activities are outlined in the following paragraphs.

CAS TA-19-002-TAB2

- Excavated all materials including the metal pan to access subsurface soils for characterization
- Loaded DU-contaminated soil and debris waste into B25 boxes, a transportainer, 55-gallon drums, and super sacks for disposal
- Collected waste characterization samples from contents of B25 box containers
- Segregated all UXO from soil and debris
- Conducted radiological surveys of debris for waste determination
- Demilitarized UXO contaminated with DU
- Positioned inert UXO to USAF recycle pile
- Collected verification samples from sidewalls and floor of excavation and ground surface of former stockpile staging area
- Transported all DU-waste containers to the NTS
- Backfilled the excavation and regraded as close to original grade as possible
- Transported solid waste generated in October 2003 to the NTS

CAS TA-21-002-TAAL

- Excavated all materials from the disposal trenches to access subsurface soils for characterization
- Segregated all UXO and DU-contaminated materials from nonhazardous soil and debris
- Demilitarized potentially live UXO and DU-contaminated UXO

- Collected verification samples from sidewalls and floor of excavation and ground surface at former DU-waste stockpile staging areas
- Backfilled the excavation as close to original grade as possible
- Collected waste management profile samples for each stockpile of soil/debris for waste determination
- Transported and disposed uncontaminated, inert UXO to USAF recycle pile
- Disposed of nonhazardous aluminum scrap to USAF recycle piles
- Loaded DU-contaminated soil and debris waste into super sacks, transportainer, and 55-gallon drums for disposal
- Hauled municipal solid waste (approximately 1,604 tons) to the Piot Landfill at the TTR
- Transported all DU-waste containers to the NTS
- Transported solid waste generated in October 2003 to the NTS

CAS 03-19-001

- Segregated and stockpiled clean overburden (as determined by field screening), visibly stained soil and debris from the burn pit excavation, and TPH-contaminated soil/debris
- Collected waste management samples for waste determination
- Collected verification samples from sidewalls and floor of burn pit and TPH excavations
- Hauled approximately 302 tons of municipal solid waste to the Piot Landfill at the TTR for disposal
- Hauled approximately 230 tons of TPH-contaminated soil and debris to the NTS hydrocarbon landfill for disposal
- Backfilled the excavation and regraded as close to original grade as possible

The analytical results for the final verification samples for CASs TA-19-002-TAB2, TA-21-002-TAAL, and 03-19-001 did not exceed corresponding levels of concern for TPH, arsenic, or radiological constituents. As anticipated, the supplemental field activities resulted in these three CASs being free of contamination greater than PALs and free of remaining debris and

UXO. Based on the sample analytical results and the actions described above, no further action is necessary at any of the five CASs that comprise CAU 410.

3.0 Recommendations

Based on the results of the corrective action investigation activities discussed in the previous sections and detailed in [Appendix A](#), no further corrective action is required for CAU 410. Results from the supplemental field activities associated with the removal of DU-contaminated waste and UXO at CASs TA-19-002-TAB2 and TA-21-002-TAAL, and removal of TPH-contaminated waste at CAS 03-19-001, presented in [Appendix A](#), indicate that no further corrective action is necessary for these CASs. Therefore, the U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office (NNSA/NSO) provides the following recommendations:

- No further corrective action is required at CAU 410.
- No Corrective Action Plan is required.
- A Notice of Completion to NNSA/NSO is requested from the NDEP for closure of CAU 410.
- CAU 410 should be moved from Appendix III to Appendix IV of the FFACO.

No use restrictions are required to be placed on this CAU because the investigation showed no evidence of remaining soil contamination or remaining debris/waste upon completion of all investigation activities.

4.0 References

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Appendix A

Corrective Action Investigation Results for CAU 410: Waste Disposal Trenches Tonopah Test Range, Nevada

A.1.0 Introduction

This appendix presents the corrective action investigation (CAI) activities and analytical results for CAU 410, which is located within the TTR. The TTR is included in the Nevada Test and Training Range (formerly called the Nellis Air Force Range), and is approximately 235 mi northwest of Las Vegas, Nevada ([Figure 1-1](#)). The five CASs that comprise CAU 410 are:

- TA-21-003-TANL, Disposal Trench
- 09-21-001-TA09, Disposal Trenches
- TA-19-002-TAB2, Debris Mound
- TA-21-002-TAAL, Disposal Trench
- 03-19-001, Waste Disposal Site

These five CASs are located in Area 3, Area 9, south Antelope Lake, and the northern area of NEDS Lake at the TTR ([Figure 1-2](#)). The CAU sites, with the exception of CAS 03-19-001, are classified as disposal trenches and debris mounds from high explosives and ordnance-related tests. The trenches vary in configuration and range in use from borrow pits to backfill holes. The Area 3 CAS (03-19-001) was added to CAU 410 as a result of CAU 405 investigation activities that identified debris and soil staining outside the original scope of the CAU 405 SWS-4 location.

The corrective action investigation was conducted in accordance with the requirements set forth in the CAIP for CAU 410 (NNSA/NV, 2002a), as developed under the FFACO (1996).

Additional information relating to the site history, planning, and scope of the investigation is presented in the CAIP (NNSA/NV, 2002a) and will not be repeated in this appendix.

A.1.1 Project Objectives

The following were the primary objectives for the investigation:

- Determine if COPCs are present within the waste debris and/or soil.
- Determine whether the COPCs, if present, exceed regulatory levels (if they do, they become COCs).

- Define the lateral and vertical extent of contamination.
- Generate sufficient information and data to satisfy DQO data needs and develop appropriate corrective action alternatives.

The selection of locations for soil sample collection were based on field screening, site conditions, and the strategy devised in the DQO process as outlined in the CAIP (NNSA/NV, 2002a).

A.1.2 Report Content

This report contains information and data in sufficient detail to support the recommendation for no further action in the CADD/CR. The contents of this report are listed below:

- [Section A.1.0](#) describes the investigation background, objectives, and the report content.
- [Section A.2.0](#) provides information regarding field activities and sampling methods.
- [Section A.3.0](#) summarizes the investigation results for CAS TA-21-003-TANL, Disposal Trench.
- [Section A.4.0](#) summarizes the investigation results for CAS 09-21-001-TA09, Disposal Trenches.
- [Section A.5.0](#) summarizes the investigation results for CAS TA-19-002-TAB2, Debris Mound.
- [Section A.6.0](#) summarizes the investigation results for CAS TA-21-002-TAAL, Disposal Trench.
- [Section A.7.0](#) summarizes the investigation results for CAS 03-19-001, Waste Disposal Site.
- [Section A.8.0](#) discusses the QA and QC procedures that were followed and the results of the QA and QC activities.
- [Section A.9.0](#) is a summary of the investigation results for CAU 410.
- [Section A.10.0](#) lists the cited references.

The complete field documentation and laboratory data, including Field Activity Daily Logs (FADLs) Sample Collection Logs, Analysis Request/Chain-of-Custody Forms, soil sample descriptions, laboratory certificates of analyses, analytical results, and surveillance results are retained in the project files.

A.2.0 Investigation Overview

The CAU 410 field investigation was conducted between October 29, 2002 and October 22, 2003. Initial investigation activities were conducted in October and November 2002. Based on the excavation and analytical results, it was determined that supplemental field activities were required to fully characterize three of the five CASs within CAU 410. Beginning in March 2003, CASs TA-19-002-TAB2, TA-21-002-TAAL, and 03-19-001 were further characterized to define the nature and extent of potential soil contamination and debris. Excavation was the primary method used to investigate all of the CASs except for CAS 09-21-001-TA09, which was investigated with a hand auger. In addition, hollow-stem auger drilling was used to assist in defining impacted soil at CAS 03-19-001, Waste Disposal Site.

The investigation and sampling program was managed in accordance with the requirements set forth in the CAIP and ROTCs No. 1 through No. 4 (NNSA/NV, 2002a). Field activities were performed under an approved site-specific health and safety plan (IT, 2002a). Samples were collected by following approved protocols and procedures for sample collection, decontamination, chain of custody, shipping, and field screening as indicated in the CAIP (NNSA/NV, 2002a) and documented using FADLs, soil boring logs, and sample collection logs. The QC samples (e.g., field blanks, equipment rinsate blanks, trip blanks, and sample duplicates) were collected as required by the CAIP (NNSA/NV, 2002a), the Industrial Sites QAPP (NNSA/NV, 2002b), and approved procedures.

A.2.1 Deviations

Deviations from the CAIP occurred at three CASs from CAU 410 resulting in the generation of four ROTCs to the CAIP and supplemental field activities. Initial trenching operations in October/November 2002 at CASs TA-19-002-TAB2, TA-21-002-TAAL, and 03-19-001 indicated vertical extents of debris and potentially impacted soil greater than predicted in the CAIP. The limited capabilities of the backhoe equipment during the initial trenching operations prevented the adequate characterization of vertical and lateral extent of debris and impacted soil at these CASs. This resulted in the need for supplemental field activities, which began in March 2003, including changes to the scope of the investigation to include segregation and separation of nonimpacted soil

from the DU-waste, UXO, and TPH-contaminated soil for waste disposal. Details regarding the CAS-specific deviations and resulting ROTCs to the CAIP are discussed in the individual CAS sections of this appendix.

A.2.2 Preliminary Conceptual Model

A single CSM was developed for CAU 410 using assumptions formulated from historical background information, knowledge from studies of similar sites, geophysical surveys, and data from previous sampling efforts. Appendix A of the CAIP provides information on the CSM as presented for DQO formulation. In general, the conceptual model was consistent for all five CASs with the exception of CAS 03-19-001 where the physical configuration was different than anticipated.

A.2.3 Sample Locations

In general, sample locations were collected as planned in the CAIP during the initial investigation. The planned sample locations for the initial investigation conducted in October/November 2002 are depicted in Figure 4-1 through Figure 4-5 in the CAIP (NNSA/NV, 2002a). The actual sample locations collected during both the initial and supplemental field investigations are depicted in various figures in each CAS-specific section. Sample locations collected during supplemental field activities focused on defining lateral and/or vertical extent of contaminated soil within excavations. The locations were selected at the discretion of the Site Supervisor and were based on visual observations, site conditions, and/or FSRs.

Documentation of sample locations were completed by a combination of GPS technology and field-located based on tape measurements and/or landmark features. Collecting GPS coordinates at most sample locations was prohibited due to safety concerns with regard to the depth of excavations. Since the deep excavations were not backfilled immediately, sample locations were noted in FADLs and reconstructed in figures based on surface features (e.g., building corners or excavation walls).

A.2.4 Investigation Activities

Investigation activities included soil sampling from backhoe excavations, hollow-stem auger borings, and surface sampling; segregation and separation of soil, debris, and UXO waste streams;

and UXO demilitarization. Waste characterization and disposal activities were also performed as a result of large volumes of investigation-derived waste (IDW) generated by the investigation.

A.2.4.1 Field Screening

Field-screening activities for VOC, TPH, HE, and alpha and beta/gamma radiation were performed as specified in the CAIP. The FSL for VOC headspace was established at 20 parts per million (ppm). The FSL for TPH was 75 ppm. The FSL for HE was 10 ppm. The site-specific FSLs for alpha and beta/gamma radiation were defined as the mean background activity level plus two times the standard deviation. Field screening was conducted using a PID for VOCs, Petroflag test kit for TPH, RDX EnSys soil test kit for HE, and an NE Technologies Electra for alpha and beta/gamma radiation.

A.2.4.2 Intrusive Investigation Activities

All five CASs were characterized by surface and/or subsurface soil sampling. Soil samples were collected using “scoop and trowel” or grab-sampling, hand auger, excavator, and hollow-stem auger drilling. Site observations of debris and/or stained soil, and FSRs were used to guide the extent of intrusive activities and determine sampling horizons. Investigation intervals and soil samples were field screened for one or more of the following: VOCs, TPH, HE, and alpha and beta/gamma radiation. The FSRs were compared against FSLs to guide the investigation and selection of samples for laboratory analysis. In addition to FSRs, other biasing factors used in the selection of biased sample locations were obvious debris or soil staining, site conditions, and professional judgement. Sample containers were filled with soil according to the following sequence: total VOCs and TPH-GRO sample containers were filled directly from the surface location, excavator bucket, or split-spoon sampler, followed by the collection of soil for VOC, TPH, or HE field screening. Additional soil was transferred into a stainless-steel bowl, homogenized, and screened for alpha and beta/gamma radiation. All remaining sample containers were then filled. If VOCs and TPH-GRO were not required, the soil was immediately transferred to the stainless-steel bowl. Selected samples were shipped to off-site laboratories to be analyzed for appropriate chemical and radiological parameters. Sample media collected but not submitted to the laboratory was returned to the collection site or placed in a waste stockpile, if applicable.

The trenching/excavation activities involved the removal of large volumes of soil, debris, and UXO to expose sampling horizons and determine site boundaries. Debris, soil mixed with debris, and/or UXO removed from an excavation was separated and placed in designated areas pending disposal. If visual observation and field screening did not indicate the presence of COPCs, the spoils were placed directly on the ground surface. In the case of TPH-contaminated soil with FSRs exceeding FSLs, the soil was placed on plastic and covered with plastic sheeting for protection from surface run-on and run-off. In the case of soil and debris contaminated with DU, the waste had to be handled twice due to the nature of the excavation activities, so spoils were placed directly on the ground. Where these contaminated soils contacted the ground surface directly, verification samples were collected after removing the stockpile for disposal to ensure all soils above PALs were disposed. Whenever possible, excavated soil with analytical results below PALs and relatively free of debris was used for backfill.

A.2.5 Waste Characterization Sampling

Because of the nature of the IDW generated at the larger excavation investigations (i.e., soil mixed with UXO or debris), it was determined that IDW would be stockpiled and disposed rather than used as backfill. Where possible, investigation samples were used to determine the waste profile to support disposal decisions; however, because most of the CASs had a limited analyte list, waste characterization samples were collected from the stockpiled IDW and analyzed for a more extensive list of analytes to support disposal decisions. The collection and analysis of these waste characterization samples followed the same procedures as investigation sampling. The specific analyses for each CAS are listed in CAS-specific sections and the analytical results are compared to Federal limits for hazardous waste, NDEP hydrocarbon action limit, landfill acceptance criteria, and the NTS Waste Acceptance Criteria (NTSWAC) established for the LLW Certification Program. Details regarding waste characterization and waste management decisions are provided in [Appendix D](#).

A.2.6 Laboratory Analytical Information

During the initial investigation, all radiological analyses were performed by Severn Trent Laboratories in Richland, Washington, and all chemical analyses were performed by EMAX Laboratories in Torrance, California. During supplemental field investigation activities, chemical

and radiological analyses were performed by Paragon Analytics, Inc., in Fort Collins, Colorado. The analytical parameters and laboratory analytical methods used to analyze CAU 410 investigation samples are listed in [Table A.2-1](#). Organic, inorganic, and radiological analytical results are compared to the minimum reporting limits (MRLs) established in the CAIP (NNSA/NV, 2002).

Table A.2-1
Laboratory Analytical Parameters and Methods, CAU 410 Samples

Analytical Parameter	Analytical Method
Total volatile organic compounds	SW-846 8260B ^a
Total semivolatile organic compound	SW-846 8270C ^a
Total petroleum hydrocarbons - gasoline-range organics	SW-846 8015B (modified) ^a
Total petroleum hydrocarbons - diesel-range organics	SW-846 8015B (modified) ^a
Total RCRA metals and beryllium	Water - SW-846 6010B or 6020/7470A ^{a,b} Soil - SW-846 6010B or 6020/7471A ^{a,b}
High Explosives	SW-846 8330 ^a
Polychlorinated biphenyls	SW-846 8082 ^a
Total pesticides	SW-846 8081A ^a
Total herbicides	SW-846 8151A ^a
TCLP volatile organic compounds	SW-846 1311/8260B ^a
TCLP semivolatile organic compounds	SW-846 1311/8270C ^a
TCLP RCRA metals	SW-846 1311/6010B/7470A ^{a,b}
Gamma spectrometry	Water and Soil PAI 713R6 ^c
Isotopic uranium	Water and Soil PAI 714R5 ^c
Isotopic plutonium	Water and Soil PAI 714R7 ^c
Ignitability	SW-846 1010 ^a

^aEPA *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, 3rd Edition, Parts 1-4, SW-846 CD ROM. Washington, DC. (EPA, 1996)

^bArsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver

^cPAI - Paragon Analytics, Inc.

The analytical results of samples collected from the CAU 410 investigation have been compiled and evaluated to determine the presence and/or extent of contamination in [Section A.3.0](#) through [Section A.7.0](#). The analytical results reported above the MRLs are summarized. The complete laboratory data packages are available in the project files.

The analytical parameters for each of the CASs within CAU 410 were initially selected through the application of site process knowledge according to the *Guidance for the Data Quality Objectives Process* (EPA, 1994b) and agreed upon during the DQO meeting. The analytical method TPH-DRO includes the carbon range C10 - C38 and will be referred to as TPH-DRO throughout this report. When TPH is used without further designation, it refers to TPH in general and may be used in conjunction with sampling or field-screening methodology. Total petroleum hydrocarbon-GRO includes the carbon range from C6 - C10.

Bioassessment samples were not collected because field investigation activities that resulted in the removal of all TPH contamination precluded the need. Geotechnical samples were not collected because investigation techniques resulted in the removal of landfill/disposal wastes thereby precluding the need for geotechnical parameters used to engineer landfill caps.

A.2.7 Comparison to PALs

Chemicals and radionuclides detected in samples at concentrations greater than PALs are identified as COCs. If COCs are present, corrective action must be considered for the CAS. The PALs for the CAU 410 investigation were identified and agreed to during the DQO process. For organic and inorganic COPCs (except TPH), the PALs are the EPA Region 9 Preliminary Remediation Goals (PRGs) under the industrial scenario (EPA, 2000b). The PAL for TPH is 100 mg/kg per the NAC 445A.2272 (NAC, 2002).

Background concentrations for metals have been used instead of PRGs when the natural background concentration exceeds the PRG, as is often the case with arsenic. Background is considered the mean plus two times the standard deviation for sediment samples collected by the Nevada Bureau of Mines and Geology throughout the Nevada Test and Training Range (formerly the Nellis Air Force Range) (NBMG, 1998; Moore, 1999). At the TTR, background concentrations range from 6 to 43 mg/kg in soils (SNL, 1999). Arsenic concentrations detected within this range are considered representative of ambient conditions at the site.

Radionuclide concentrations measured in CAU 410 environmental samples were compared to isotope-specific PALs. A radionuclide PAL is defined as the maximum concentration in an environmental sample taken from an undisturbed background location in the vicinity of the NTS

and throughout the state of Nevada or the minimum detectable concentration (MDC) if the isotope is not reported or reported below the MDC (NNSA/NV, 2002a). The PALs for cesium-137, U-234, U-235, U-238, plutonium-238, and plutonium-239/240 are listed in Table 3-2 of the CAIP (NNSA/NV, 2002a).

The PALs for the naturally-occurring, gamma-emitting radionuclides actinium-228, bismuth-212, bismuth-214, lead-212, lead-214, radium-226, thorium-232, thorium-234, and thallium-208 were established from the characterization gamma spectroscopy data reported in the *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste Facility* by US Ecology and Atlan-Tech (1991). The PAL for the naturally-occurring, gamma-emitting radionuclide potassium-40 is established from samples collected in Beatty, Nevada, and reported in McArthur and Miller (1989). For a more detailed discussion on the PALs for the gamma-emitting radionuclides see Adams (2003).

If a sample has a positive concentration for any radionuclide with a corresponding PAL, the sample result and its PAL concentration data are statistically compared. The normalized difference test is used for this comparison (Paar and Porterfield, 1997). The test is defined as:

$$t = \frac{R - \text{PAL}}{\sqrt{\sigma_R^2 + \sigma_{\text{PAL}}^2}}$$

where:

- t = Normalized Difference Result
- R = Sample Radioanalytical Result
- PAL = Preliminary Action Level
- F_R^2 = 2 Sigma Uncertainty in Radioanalytical Result
- F_{PAL}^2 = 2 Sigma Uncertainty in PAL

The statistical assumptions inherent to the normalized difference test are as follows:

- The sample counts are drawn from normally distributed populations.
- The counts for the sample and the PAL are centered on the sample result and the PAL.
- The width parameter of the distribution is equal to two sigma.

The “reasonable confidence” has been set to 95 percent for this comparison test. This means that for the sample radioanalytical result to statistically differ from the PAL (with a 95 percent confidence level), the normalized difference between the PAL and the sample radioanalytical result must be greater than 1.96. If the normalized difference is less than or equal to 1.96, the sample result and the PAL differ by less than or equal to a 5 percent level of significance. If the normalized difference is greater than 1.96, there is a 95 percent confidence that the result is greater than the PAL. The result is ultimately considered to be greater than the PAL if it is statistically different than the background-based PAL.

Sample data that exceed MRLs are tabulated in the CAS-specific sections that follow. Results that are greater than PALs (a subset of those that exceed PALs) are identified by bold text in the corresponding tables and discussed in [Section A.3.0](#) through [Section A.7.0](#). Nondetected results and results below MRLs have been excluded to minimize the size of this document. However, the unedited data set for CAU 410 is retained in an electronic format in project files.

A.2.8 Geology

Corrective Action Unit 410 and most of the TTR is located in Cactus Flat, which is an intermontane basin typical of the Basin and Range Physiographic Province. Cactus Flat is made up of Quaternary-aged alluvium eroded from the surrounding volcanic highlands (DOE/NV, 1994; USGS, 1971). Alluvium within the Cactus Flat valley may exceed 1,000 ft and is underlain by volcanic tuffs and lavas (DOE/NV, 1996). Locally, the borrow pits/disposal trenches at each CAS consisted of disturbed/reworked well-graded silty sand to gravelly sands overlying native soil. Native soil was compacted silts and silty sands in the dry playa regions (Antelope Lake and NEDS Lake) and fine to gravelly moderately consolidated sands within Area 3. The percentage of organic matter in the soil was negligible. The general field description for each sample was recorded on sample collection logs by a sample team member.

A.2.9 Hydrology

Although three CASs lie within the topographic low of Cactus Flat where the drainage of surface waters is directed towards the dry playa lakes, only CAS TA-19-002-TAB2 was considered potentially impacted by surface water due to debris and contaminants near the surface. Therefore,

additional considerations were made for supplemental field activities necessary to ensure adequate characterization. There are no perennial streamflows or spring discharges in the Cactus Flat valley floor. The Area 3 topography slopes gently in all directions with surface drainage flowing northwest but was not considered to be critical in the characterization of the subsurface impacted soils of 03-19-001.

Groundwater depth at TTR ranges from 156 ft bgs in Area 9 to over 350 ft bgs at Area 3 (DOE/NV, 1996; USGS, 2001). The water table was not intercepted during any of the subsurface investigations. Due to this fact and the areas's low precipitation and high evapotranspiration rates, groundwater is not considered a migration pathway for CAU 410.

A.3.0 CAS TA-21-003-TANL, Disposal Trench

This CAS is located at the northern end of NEDS Lake adjacent to the dry playa. The site consists of one 50- by 20-ft depression approximately 3 ft deep. The site had been covered by an arched structure that had been moved prior to the investigation. There is no significant surface debris; however, geophysical surveys identified subsurface debris in the eastern end of the depression.

Prior to intrusive activities, UXO personnel performed an avoidance survey around the CAS footprint to identify any potential UXO and mark out the work area to protect the health and safety of workers.

A.3.1 Corrective Action Investigation

A total of two environmental soil samples were collected using a backhoe and submitted for laboratory analyses. In addition, one QC duplicate sample, one QA field blank and one QC trip blank were collected and submitted for laboratory analysis. A list of the samples collected and the parameters analyzed for are presented in [Table A.3-1](#).

Table A.3-1
Samples Collected for CAS TA-21-003-TANL, Disposal Trench

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
410NL001	10/30/2002	West End of Trench	4 - 4.5	Soil	SC, Lab QC	Set 2
410NL002		East End of Trench	3 - 3.5	Soil	SC	Set 2
410NL003			3 - 3.5	Soil	Field Duplicate of #410NL002	Set 2
410NL301		NA	NA	Water	Trip Blank	Total VOCs
410NL302	10/31/2002	NA	NA	Water	Field Blank	Set 2

Set 2 = Total VOCs, Total SVOCs, Total RCRA Metals, High Explosives, Total Beryllium, Gamma Spectrometry, TPH (DRO-GRO), Isotopic Uranium and Isotopic Plutonium

SC = Site characterization

NA = Not applicable

QC = Quality control

ft bgs = Feet below ground surface

A.3.1.1 CAIP Implementation

The following CAI activities were conducted to meet CAIP requirements:

- Excavated through the depression along east-west axis.
- Collected two subsurface soils samples at the native-soil interface.
- Field screened soils for alpha and beta/gamma radiation.
- Backfilled the excavation with excavated soils.

A.3.1.2 Deviations

There were no significant deviations from the CAIP. One sample location was moved from the bottom of the excavation to beneath the tin can uncovered in the excavation as a biased sample location.

A.3.2 Investigation Activities

The following sections provide CAS-specific details of excavation, field screening, and sample selection and analysis.

A.3.2.1 Field Screening

Field screening was performed as specified in the CAIP (NNSA/NV, 2002a). Samples were field screened for alpha/beta-emitting radionuclides. Since no biasing factors were observed during excavation and no indication of explosives exists within the area, the soils were not screened for explosives. Established FSLs were used to guide sample collection and to provide a basis for the selection of additional environmental samples for laboratory analyses.

A.3.2.2 Excavation

Investigation activities conducted on October 30, 2002, consisted of one trench excavated through the center of the depression to a depth of approximately 2 ft bgs (see [Figure A.3-1](#)). The eastern end of the existing depression was excavated to investigate an anomaly that was identified during the 2002 geophysical survey (Shaw, 2002). Excavation of this anomaly revealed an empty tin can with no apparent staining or elevated radiological screening measurements.

Figure A.3-1
CAU 410, CAS TA-21-003-TANL, Soil Sample Locations

In accordance with the CAIP, two soil samples were collected from the native-soil interface within the trench at the locations presented on [Figure A.3-1](#). Sample 410NL001 was collected from the native soil interface beneath the tin can along the slope of the depression. The second sampling location (410NL002 and duplicate sample 410NL003) was approximately 4 to 4.5 ft below the original ground surface elevation on the western end of the depression within the excavated trench. Since the FSRs did not exceed the FSLs, contamination was not identified within or on the boundary of the trench, no additional excavation or step-out sampling was necessary. Following the collection of the two soil samples, the excavation trench was backfilled and no further activities were conducted at this CAS.

A.3.2.3 Waste Characterization

No CAS-specific waste characterization activities were performed because there was no soil waste generated.

A.3.2.4 Sample Analysis

Investigation samples were submitted for analyses including total VOCs, total SVOCs, total RCRA metals, HEs, total beryllium, TPH-DRO and -GRO, gamma spectrometry, isotopic uranium, and isotopic plutonium.

A.3.3 Analytes Detected Above MRL

The analytical results detected at concentrations exceeding the correlated MRLs at this CAS are summarized in the following sections.

A.3.3.1 Total RCRA Metals Results

The total RCRA metals results for soil samples collected from CAS TA-21-003-TANL, which were detected above MRLs, are presented in [Table A.3-2](#). All the total metal results are below PALs (NNSA/NV, 2002a).

Table A.3-2
Soil Sample Results for Total RCRA Metals Detected
Above Minimum Reporting Limits at CAS TA-21-003-TANL

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (mg/kg)			
			Arsenic	Barium	Chromium	Lead
Preliminary Action Levels ^a			23 ^b	100,000	450	750
410NL001	West End of Trench	4 - 4.5	6.77	199	7.23	9.65
410NL002	East End of Trench	3 - 3.5	4.64	167	7.78	117
410NL003		3 - 3.5	4.68	150	8.05	72.2

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

^bBased on background concentrations for metals. Background is considered the mean plus two standard deviation for sediment samples collected by the Nevada Bureau of Mines and Geology throughout the Nevada Test and Training Range (NBMG, 1998; Moore, 1999).

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

A.3.3.2 Isotopic Uranium Results

The isotopic uranium results for soil samples collected from CAS TA-21-003-TANL, which were detected above MRLs, are presented on [Table A.3-3](#). All isotopic uranium results are below PALs (NNSA/NV, 2002a).

Table A.3-3
Soil Sample Results for Isotopic Uranium
Detected Above Minimum Reporting Limits at CAS TA-21-003-TANL

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)		
			Uranium-234	Uranium-235	Uranium-238
Preliminary Action Levels ^a			3.47	0.07	3.47
410NL001	West End of Trench	4 - 4.5	1.47 ± 0.28	0.0453 ± 0.019 (J)	1.21 ± 0.23
410NL002	East End of Trench	3 - 3.5	1.4 ± 0.27	0.0536 ± 0.021	1.66 ± 0.31
410NL003		3 - 3.5	1.22 ± 0.23	0.052 ± 0.019	1.63 ± 0.3

^aBased on background concentration listed in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

J = Estimated value

A.3.3.3 Gamma-Emitting Radionuclides Results

The gamma-emitting radionuclides results for soil samples collected from CAS TA-21-003-TANL, which were detected above MRLs, are presented on [Table A.3-4](#). Except for potassium-40, all gamma-emitting radionuclide results were below PALs (NNSA/NV, 2002a). Potassium-40 was detected in one sample at a concentration exceeding the PAL; however, potassium-40 analytical results were evaluated using the normalized difference test as discussed in [Section A.2.7](#), and the potassium-40 concentrations over the PAL in the soil sample are considered indistinguishable from the PAL.

A.3.4 Contaminants of Concern

Based on analytical results, there were no COCs identified in the soil.

A.3.5 Nature and Extent of Contamination

Excavation showed the geophysical anomaly on the east end of the trench was an empty tin can with no associated soil contamination. The remaining area of the depression/trench was free of contamination.

A.3.6 Revised Conceptual Site Model

No variations to the CSM were identified.

Table A.3-4
Soil Sample Results for Gamma-Emitting Radionuclides Detected
Above Minimum Reporting Limits at CAS TA-21-003-TANL

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)							
			Actinium-228	Bismuth-214	Lead-212	Lead-214	Potassium-40	Radium-226	Thorium-232	Thallium-208
Preliminary Action Levels			3.64 ^a	3.47 ^a	3.64 ^a	3.47 ^a	30.7 ^b	3.47 ^a	3.64 ^a	3.38 ^a
410NL001	West End of Trench	4 - 4.5	1.97 ± 0.44	--	1.8 ± 0.36	1.33 ± 0.32	25.8 ± 4.1	1.31 ± 0.28	2.04 ± 0.58	0.676 ± 0.16
410NL002	East End of Trench	3 - 3.5	2.06 ± 0.46	2.39 ± 0.8	2.14 ± 0.38	1.19 ± 0.29	31.9 ± 4.7	1.46 ± 0.28	2.35 ± 0.68	0.731 ± 0.15
410NL003		3 - 3.5	--	--	1.59 ± 0.4	1.31 ± 0.3	29.2 ± 4.2	--	1.86 ± 0.67	0.566 ± 0.15

^aBased on background concentration reported in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

^bBased on background concentration listed or derived in *Off-Site Radiation Exposure Review Project, Phase II Soil Program* (McArthur and Miller, 1989)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

-- = Not detected above minimum reporting limit

A.4.0 CAS 09-21-001-TA09, Disposal Trenches

This CAS is located on the northern side of Area 9 near Main Lake. The site consists of two perpendicular trenches that meet at the southwest corner. The east-west trench is approximately 200- by 90-ft and the north-south trench is approximately 270- by 60-ft. Each trench has a visible low spot but no staining or significant debris. Geophysical surveys did not identify any subsurface debris.

Prior to intrusive activities, UXO personnel performed an avoidance survey around the CAS footprint to identify any potential UXO and mark out the work area to protect the health and safety of workers.

A.4.1 Corrective Action Investigation

A total of two environmental soil samples were collected using hand augers and submitted for laboratory analyses. In addition, one QC duplicate sample, and one QC field blank were collected and submitted for laboratory analysis. A list of the samples collected and the parameters analyzed for are presented in [Table A.4-1](#).

Table A.4-1
Samples Collected for CAS 09-21-001-TA09, Disposal Trenches

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
41009001	11/5/2002	NS Trench	0 - 2.5	Soil	SC, Lab QC	Set 3
41009002		EW Trench	0 - 2.5	Soil	SC	Set 3
41009003			0 - 2.5	Soil	Field Duplicate of #41009002	Set 3
41009301		NA	NA	Water	Field Blank	Set 3

Set 3 = Total VOCs, Total SVOCs, Total RCRA Metals, High Explosives, and Gamma Spectrometry

SC = Site characterization

NA = Not applicable

QC = Quality control

ft bgs = Feet below ground surface

A.4.2 CAIP Implementation

The following CAI activities were conducted to meet CAIP requirements:

- Collected two surface soil samples for laboratory analysis
- Field screened the soil for alpha and beta/gamma radiation

A.4.2.1 Deviations

There were no deviations from the CAIP.

A.4.3 Investigation Activities

The following sections provide CAS-specific details of field screening and sample collection and analysis.

A.4.3.1 Field Screening

Field screening was performed as specified in the CAIP (NNSA/NV, 2002a). Samples were field screened only for alpha and beta/gamma radiation as no other field indicators suggested the need for additional screening for TPH or HE. None of the samples exceeded the alpha or beta/gamma FSLs.

A.4.3.2 Excavation

Since the sampling was conducted with hand augers, no excavation was conducted at this CAS.

A.4.3.3 Sample Collection

During the geophysical surveys, no subsurface buried debris was located; therefore, surface sampling was performed using a hand auger to collect soil from low spots within the CAS. Surface sample 41009001 was collected from the north-south trending depression, whereas surface sample 41009002 and duplicate sample 41009003 were collected from the east-west trending depression. The locations of these samples are shown on [Figure A.4-1](#). Native soils consisting of cemented, caliche were encountered. Therefore, since native soils were encountered at the two sampling locations, and there was no apparent staining or debris, no additional sampling was conducted at this CAS.

Figure A.4-1
CAU 410, CAS 09-21-001-TA09, Soil Sampling Locations

A.4.3.4 Waste Characterization

No CAS-specific waste characterization activities were performed because there was no soil waste generated.

A.4.3.5 Sample Analysis

The analytical results for soil samples collected at TA-21-003-TANL indicated that COCs are not present in the soil at this site. The soil samples were submitted for analyses including total VOCs, total SVOCs, total RCRA metals, HEs, and gamma spectrometry.

A.4.4 Analytes Detected Above MRL

The analytical results detected at concentrations exceeding the correlated MRLs at this CAS are summarized in the following sections.

A.4.4.1 Total RCRA Metals Results

The total RCRA metals results for soil samples collected from CAS 09-21-001-TA09, which were detected above MRLs, are presented in [Table A.4-2](#). All the total RCRA metal results are below PALs (NNSA/NV, 2002a).

Table A.4-2
Soil Sample Results for Total RCRA Metals
Detected Above Minimum Reporting Limits at CAS 09-21-001-TA09

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (mg/kg)			
			Arsenic	Barium	Chromium	Lead
Preliminary Action Levels ^a			23 ^b	100,000	450	750
41009001	NS Trench	0 - 2.5	7.1	102	6.65	6.56
41009002	EW Trench	0 - 2.5	6.99	103	6.47	6.34
41009003		0 - 2.5	6.49	106	6.33	6.6

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

^bBased on background concentrations for metals. Background is considered the mean plus two standard deviation for sediment samples collected by the Nevada Bureau of Mines and Geology throughout the Nevada Test and Training Range (NBMG, 1998; Moore, 1999).

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

A.4.4.2 Gamma-Emitting Radionuclides Results

The gamma-emitting radionuclides results for soil samples collected from CAS 09-21-001-TA09, which were detected above MRLs, are presented on [Table A.4-3](#). All gamma-emitting radionuclides results are below PALs (NNSA/NV, 2002a).

A.4.5 Contaminants of Concern

Based on analytical results, there were no COCs identified in the soil.

A.4.6 Nature and Extent of Contamination

Analytical results show there is no contamination at this site.

A.4.7 Revised Conceptual Site Model

No variations to the CSM were identified.

Table A.4-3
Soil Sample Results for Gamma-Emitting Radionuclides
Detected Above Minimum Reporting Limits at CAS 09-21-001-TA09

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)						
			Actinium-228	Lead-212	Lead-214	Potassium-40	Radium-226	Thorium-232	Thallium-208
Preliminary Action Levels			3.64 ^a	3.64 ^a	3.47 ^a	30.7 ^b	3.47 ^a	3.64 ^a	3.38 ^a
41009001	NS Trench	0 - 2.5	--	2.59 ± 0.59	1.46 ± 0.35	29.3 ± 4.5	--	2.71 ± 0.87	--
41009002	EW Trench	0 - 2.5	1.36 ± 0.48	1.98 ± 0.36	1.78 ± 0.35	30.1 ± 4.5	1.56 ± 0.31	2.22 ± 0.8	0.805 ± 0.15
41009003		0 - 2.5	1.73 ± 0.5	2.12 ± 0.42	1.78 ± 0.38	29.8 ± 4.4	--	1.76 ± 0.8	0.567 ± 0.16

^aBased on background concentration reported in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

^bBased on background concentration listed or derived in *Off-Site Radiation Exposure Review Project, Phase II Soil Program* (McArthur and Miller, 1989)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

-- = Not detected above minimum reporting limits

A.5.0 CAS TA-19-002-TAB2, Debris Mound (Bunker 2 Site)

This CAS is located on the northern end of NEDS Lake near the Bunker 2 storage facility. The site consisted of a debris mound approximately 15- by 20-ft surrounded by a disturbed surface area approximately 110- by 120-ft. Prior to the investigation, the mound had exposed debris at the surface consistent with geophysical surveys that identified an anomaly approximately the same dimensions of the mound.

Prior to intrusive activities, UXO personnel performed an avoidance survey around the CAS footprint to identify any potential UXO and mark out the work area to protect the health and safety of workers.

A.5.1 Corrective Action Investigation

A total of 23 environmental soil samples (includes characterization and confirmation samples) were collected and submitted for laboratory analyses. In addition, two QC field duplicates, two QC field blanks, one QC equipment rinsate blank, and six QC trip blanks were collected and submitted for laboratory analysis. A list of the samples collected and the parameters analyzed for is presented [Table A.5-1](#).

[Table A.5-1](#) also provides sample information on the seven waste characterization soil samples collected and submitted for analysis. Although presented in this table for completeness, discussion regarding sample collection and the waste characterization analytical results are provided in [Appendix D](#).

A.5.2 CAIP Implementation

The following CAI activities were performed to the meet the CAIP requirements:

- Excavated the debris mound to identify nature and extent of buried materials
- Field screened soils for alpha and beta/gamma radiation and HES
- Collected subsurface samples at the native soil interface beneath debris
- Collected one surface sample downstream from debris mound
- Collected multiple confirmation samples from excavation and location of waste piles
- Segregated and separated soil, debris, and UXO for proper waste disposal

Table A.5-1
Samples Collected for CAS TA-19-002-TAB2, Debris Mound
(Page 1 of 2)

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
410B2001	10/30/2002	North Corner Under Metal Tray	2.5 - 3	Soil	SC, Lab QC	Set 1
410B2002		South Corner Under Metal Tray	2 - 2.5	Soil	SC	Set 1
410B2003			2 - 2.5	Soil	Field Duplicate of #410B2002	Set 1
410B2004	10/31/2002	Thirty Feet West of Debris Pile	0 - 0.5	Soil	SC	Set 1
410B2005	11/6/2002	Near West Corner of Metal Tray	0 - 0.5	Soil	SC	Gamma Spectrometry
410B2006	11/5/2002	NA	NA	Unknown Material	SC	Isotopic Uranium, Gamma Spectrometry
410B2007	3/27/2003	West Sidewall	2 - 3	Soil	Confirmation	Set 5
410B2008		North Sidewall	2 - 3	Soil	Confirmation	Set 5
410B2009		East Sidewall	2 - 3	Soil	Confirmation	Set 5
410B2010		South Sidewall	2 - 3	Soil	Confirmation	Set 5
410B2011		Floor Southend	2 - 3	Soil	Confirmation	Set 5
410B2012		Floor Northend	2 - 3	Soil	Confirmation	Set 5
410B2013	9/11/2003	East Sidewall	2 - 3	Soil	Confirmation	Isotopic Uranium and PCBs
410B2014		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium and PCBs
410B2015		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium and PCBs
410B2016	10/14/2003	Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2017		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2018		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2019		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2020		Stockpile location	0 - 0.5	Soil	Field Duplicate of #410B2019	Isotopic Uranium
410B2021		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2022		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2023		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2024		East sidewalk/stockpile	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2034	10/22/2003	Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic Uranium
410B2301	10/30/2002	NA	NA	Water	Trip Blank	Total VOCs

Table A.5-1
Samples Collected for CAS TA-19-002-TAB2, Debris Mound
(Page 2 of 2)

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
410B2302	10/31/2002	NA	NA	Water	Trip Blank	Total VOCs
410B2303		Thirty Feet West of Debris Pile	NA	Water	Field Blank	Set 1
410B2304	11/6/2002	NA	NA	Water	Trip Blank	Total VOCs
410B2305		Decon Area	NA	Water	Equipment Rinsate Blank	Set 2
410B2306	3/18/2003	NA	NA	Water	Trip Blank	Total VOCs
410B2307	3/19/2003	NA	NA	Water	Trip Blank	Total VOCs
410B2308	3/27/2003	NA	NA	Water	Trip Blank	Total VOCs
410B2309	10/14/03	Stockpile location	NA	Water	Field Blank	Isotopic Uranium
410B2501	3/18/2003	NA	NA	Soil	WM	Set 5
410B2502		NA	NA	Soil	WM	Set 5
410B2503	3/19/2003	NA	NA	Soil	WM	Set 5
410B2504		NA	NA	Soil	WM	Set 5
410B2505		NA	NA	Soil	WM	Set 5
410B2506		NA	NA	Soil	WM	Set 5
410B2507	10/14/03	NA	NA	Soil	WM	Isotopic Uranium

Set 1 = Total VOCs, Total SVOCs, Total RCRA Metals, High Explosives, Gamma Spectrometry, and Isotopic Uranium

Set 2 = Total VOCs, Total SVOCs, Total RCRA Metals, High Explosives, TPH (DRO-GRO), Total Beryllium, Gamma Spectrometry, Isotopic Uranium, and Isotopic Plutonium

Set 5 = Total VOCs, Total SVOCs, Total RCRA Metals, Total Beryllium, High Explosives, TPH (DRO-GRO), Isotopic Uranium, Isotopic Plutonium, Gamma Spectrometry, PCBs, Pesticides, and Herbicides

SC = Site characterization

NA = Not applicable

QC = Quality control

WM = Waste management

ft bgs = Feet below ground surface

- Conducted waste characterization sampling for waste profiles
- Disposed of all IDW from the site including the demilitarization of potentially live ordnance
- Backfilled the excavation with clean fill

A.5.3 Investigation Activities

The following sections provide CAS-specific details of excavation, field screening, and sample collection and analysis. The various phases of the initial and supplemental activities for CAS TA-19-002-TABZ are summarized in [Table A.5-2](#).

Table A.5-2
Summary of Excavation Activities at CAS TA-19-002-TAB2

Date of Activities	Activity Summary
October 30 to 31, 2002	Excavation activities uncovered large metal pan, debris contaminated with DU, and UXO. Samples 410B2001 to 410B2004 were collected.
November 5 and 6, 2002	Separated and segregated UXO from debris and soil. Took inventory of types of materials and replaced all soil and debris back into metal pan. Collected samples 410B2005 and 410B2006.
March 18 to 27, 2003	Supplemental field activities commenced with the reexcavation of DU-contaminated materials and the metal pan for disposal into waste containers. The ground surface was surveyed and the remaining DU-contaminated soil was stockpiled for eventual disposal. Confirmation samples 410B2007 through 410B2012 were collected from the floor and sidewalls of the excavation.
April 25, 2003	The inert cluster bomb submunitions were moved from the CAS to the recycle pile located on range.
May 13, 2003	The USAF EOD and Shaw UXO personnel demilitarized the DU-contaminated cluster bomb submunitions and fuze.
September 11, 2003	Based on the results of sample 410B2009, which had DU above PALs, additional soil was removed from the east sidewall of the excavation and confirmation sample 410B2013 was collected. Verification samples 410B2014 and 410B2015 were collected from the former stockpile area. Results indicated that the soil in the east sidewall and portions of the stockpile area had DU contamination remaining above PALs.
October 14, 2003	Removed additional contaminated soil from the east sidewall and surface of former stockpile area. Collected nine additional verification samples (410B2016 to 410B2024). The result of 410B2021 indicated DU contamination above PALs remained within the grid area sampled.
October 22, 2003	Removed additional soil from the grid area of sample 410B2021 and collected sample 410B2034 for verification analysis. Analytical results confirm that uranium is below PALs. Summary: All soils associated with elevated uranium results within the excavation and former stockpile area have been excavated and removed. The most recent verification samples indicate remaining soil is below PALs.

A.5.3.1 Field Screening

Field screening was performed as specified in the CAIP (NNSA/NV, 2002a). Established FSLs were used to guide sample collection and to provide a basis for the completion of excavation activities. Soil was field screened for HE during the initial investigation with results indicating

FSRs below FSLs. Based on field-screening data and analytical results from November 2002, additional field screening for HEs was not conducted during the supplemental field activities.

Field-screening results for alpha and beta/gamma radiation during the initial excavation indicated debris and soil within the metal pan was contaminated with DU; however, FSRs on soil samples collected from beneath two corners of the metal tray indicated background levels. Radiological readings on solid materials within the metal pan indicated the need to post the debris mound as a Radiological Materials Area (RMA) pending supplemental field activities. Following the removal of the metal pan to reach vertical and lateral sample horizons during the supplemental field investigation, the confirmation soil samples collected in March 2003 had FSRs below FSLs.

A.5.3.2 Excavation

Due to safety concerns for potential UXO hazards within the debris mound, only essential personnel (i.e., qualified UXO personnel) were allowed to perform excavation activities within the established exclusion zone (EZ) (approximate 4,000-ft radius). A backhoe was used to excavate small lifts of material for inspection by UXO personnel. If UXO was identified, it was segregated from soil and debris. During the CAU investigation activities conducted from October 30 through November 6, 2002, the initial excavation at the site confirmed the presence of subsurface debris and ordnance at the mound area. On October 30, 2002, excavation activities identified buried debris material which appeared to be confined to the mound area and within the limits of a buried pan-shaped metal object approximately 10- by 15-ft. The metal pan had an open top and a height of approximately 12- to 18-inches and held materials such as soil, metal posts, UXO, drogue chutes, explosives containers, and other miscellaneous debris ([Figure A.5-1](#)). Field screening confirmed that DU contamination was present on materials. On November 5 and 6, 2002, additional excavation activities were conducted to complete UXO recovery operations due to UXO safety concerns. This work involved removing all soil and debris for UXO screening and segregation. At this time an inventory and radiological field screening of removed materials was performed as well as limited soil sampling ([Figure A.5-2](#)). Due to size of the metal pan and the inability to move the pan-shaped metal object, the vertical extent of the debris and potentially contaminated material could not be determined. All materials, except the segregated UXO, were replaced into the metal

pan and posted as a RMA pending supplemental field activities to fully characterize the subsurface soil.

Figure A.5-1
Bunker 2 Debris

(Bunker 2 debris after being excavated,
photo taken November 2002)

In accordance with ROTC No. 2, to the CAIP, which outlined the proposed removal of contaminated soil and debris from CAS TA-19-002-TAB2, further excavation activities were conducted starting March 18, 2003, to better define the extent of potential contamination. Upon the excavation and removal of all debris and the metal pan, vertical and lateral subsurface soil samples were collected for analysis to confirm the extent of contamination was delineated. The excavation activities were completed on March 27, 2003, and six confirmation samples were collected from the sidewalls and floor of the excavation. [Figure A.5-3](#) shows the sample locations collected during both the initial and supplemental field investigations. The vertical extent of contamination was defined and confirmed by these samples. The lateral extent of contamination on three sidewalls was also defined. Two east sidewall samples (410B2009 and 410B2013) collected in March and September 2003, respectively, indicated DU still remained in the soil above PALs. The eastern sidewall had been the location of extensive excavation, removal, and waste loading of contaminated materials during supplemental field activities. Additional soil was removed to define the lateral

Figure A.5-2
Bunker 2 Radiological Survey
(Radiological survey of Bunker 2 debris,
photo taken November 2002)

extent of the DU and the sidewall resampled on October 14, 2003 (410B2024). This analytical result was below PALs and defined the lateral extent of DU on the east sidewall at this CAS.

[Figure A.5-4](#) shows the former location of the metal pan and debris following site characterization.

The initial two verification samples collected from the ground surface of the former DU-waste stockpile area indicated DU contamination still remained. Additional soil was removed on October 14 and 22, 2003, and nine additional verification samples were collected (410B2016) to 410B2024). These results confirmed that DU in surface soil is below PALs. The disposal activities, along with the collection of samples for waste characterization, are discussed in greater detail in [Appendix D](#).

Figure A.5-3
CAU 410, CAS TA-19-002-TAB2, Soil Sampling Locations

Figure A.5-4
Bunker 2 Debris
(Bunker 2 debris after being excavated,
photo taken March 2003)

A.5.3.3 Waste Characterization

The DU-contaminated materials were separated and segregated prior to being loaded into waste disposal containers. Composite soil samples were collected that represented the containerized soil waste. The samples were submitted for laboratory analyses of selected analytes necessary to compare to the Waste Acceptance Criteria for disposal at the Area 3 and Area 5 RWMS or the U10C disposal site at the NTS.

In addition to DU-impacted soil and debris, 132 cluster bomb submunitions ordnance were identified and segregated from the rest of the debris (see [Figure A.5-1](#)). Of the 132 cluster bomb submunitions identified, 35 had fixed DU; therefore, were demilitarized by USAF EOD personnel. The remaining 97 cluster bomb submunitions were determined to be inert by USAF EOD personnel and were moved to the USAF recycle pile. These activities were conducted in accordance with ROTC No. 4 to the CAIP, which outlined the removal of UXO and ordnance debris from CAS

TA-19-002-TAB2, Debris Mound. The UXO and debris disposal activities are described in greater detail in [Appendix D](#).

A.5.3.4 Sample Analysis

Site characterization samples that were collected during the initial October and November 2002 investigation were compared to PALs for the following parameters: total VOCs, total SVOCs, total RCRA metals, HEs, gamma spectrometry, and isotopic uranium. Following supplemental excavation activities in 2003 to determine the extent of contamination, verification samples were compared to PALs for total VOCs, total SVOCs, total RCRA metals, HEs, total beryllium, gamma spectrometry, TPH-DRO and -GRO, PCBs, pesticides, herbicides, isotopic uranium, and isotopic plutonium.

A.5.4 Analytes Detected Above MRL

The analytical results detected at concentrations exceeding the correlated MRLs at this CAS are summarized in the following sections.

A.5.4.1 Total VOCs

The total VOC results for soil samples collected from CAS TA-19-002-TAB2, which were detected above MRLs, are presented on [Table A.5-3](#). All total VOC results are below PALs (NNSA/NV, 2002a).

**Table A.5-3
Soil Sample Results for Total VOCs Detected
Above Minimum Reporting Limits at CAS TA-19-002-TAB2**

Sample Number	Sample Location	Depth (ft bgs)	Contaminates of Potential Concern (µg/kg)	
			1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene
Preliminary Action Levels ^a			NI	3,000,000
410B2009	East Sidewall	2 - 3	7.2	21

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals* (PRGs) (EPA, 2000b)

ft bgs = Feet below ground surface
µg/kg = Micrograms per kilogram
NI = Not identified

A.5.4.2 Total Metals

The total metals results for soil samples collected from CAS TA-19-002-TAB2, which were detected above MRLs, are presented on [Table A.5-4](#). All total metals results are below PALs (NNSA/NV, 2002a).

Table A.5-4
Soil Sample Results for Metals Detected Above
Minimum Reporting Limits at CAS TA-19-002-TAB2

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (mg/kg)					
			Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
Preliminary Action Levels ^a			23 ^b	100,000	2,200	810	450	750
410B2001	North Corner Under Metal Tray	2.5 - 3	4.11	106	--	--	5.16	7.1
410B2002	South Corner Under Metal Tray	2 - 2.5	4.32	129	--	--	7.41	8.88
410B2003		2 - 2.5	4.33	124	--	--	6.99	8.7
410B2004	Thirty Ft West of Debris Pile	0 - 0.5	3.43	130	--	--	5.91	9.25
410B2007	West Sidewall	2 - 3	5.7	110	0.81	--	6.2	9.8
410B2008	North Sidewall	2 - 3	6.7	100	0.71	--	5.4	8.7
410B2009	East Sidewall	2 - 3	6.3	110	0.72	0.85	6.5	10
410B2010	South Sidewall	2 - 3	5.9	100	0.67	--	5.1	9.1
410B2011	Floor Southend	2 - 3	6.1	150	--	--	3.6	7
410B2012	Floor Northend	2 - 3	8.4	120	0.68	--	5.4	7.4

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

^bBased on background concentrations for metals. Background is considered the mean plus two standard deviation for sediment samples collected by the Nevada Bureau of Mines and Geology throughout the Nevada Test and Training Range (NBMG, 1998; Moore, 1999).

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

-- = Not detected above minimum reporting limits

A.5.4.3 PCBs

The PCBs results for soil samples collected from CAS TA-19-002-TAB2, which were detected above MRLs, are presented on [Table A.5-5](#). All results are below PALs (NNSA/NV, 2002a).

Table A.5-5
Soil Sample Results for PCBs Detected
Above Minimum Reporting Limits at CAS TA-19-002-TAB2

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (µg/kg)
			Aroclor-1254
Preliminary Action Levels ^a			1,000
410B2009RR1	East Sidewall	2 - 3	570
410B2013	East Sidewall	2 - 3	300
410B2014	Stockpile location	0 - 0.5	540
410B2015	Stockpile location	0 - 0.5	50

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

ft bgs = Feet below ground surface
µg/kg = Micrograms per kilogram

A.5.4.4 Isotopic Uranium

The isotopic uranium results for soil samples collected from CAS TA-19-002-TAB2, which were detected above MRLs, are presented on [Table A.5-6](#). Several samples had U-234, U-235, and U-238 concentrations exceeding the respective PALs. Uranium-234, U-235, and U-238 analytical results were evaluated using the normalized difference test as discussed in [Section A.2.7](#), and the concentrations in samples 410B2002, 410B2003, 410B2008, 410B2011, and 410B2012 are considered indistinguishable from the PAL. Confirmation samples 410B2009, 410B2013, 410B2014, and 410B2021 have U-235 and U-238 concentrations considered distinguishable from the PAL. Samples 410B2009 and 410B2013 represent the eastern sidewall confirmation samples. Samples 410B2014 and 410B2021 represent the ground surface beneath the former DU-waste stockpile. See [Section A.5.3.2](#) for details regarding additional soil removal and sampling.

[Table A.5-7](#) shows the isotopic uranium results of an unknown solid material found within the boundaries of the metal pan object. This solid material (sample 410B2006) was submitted for analysis to confirm that DU was the COC for the soil/debris; therefore, it was expected to have concentrations exceeding PALs.

Table A.5-6
Soil Sample Results for Isotopic Uranium
Detected Above Minimum Reporting Limits at CAS TA-19-002-TAB2

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)		
			Uranium-234	Uranium-235	Uranium-238
Preliminary Action Levels ^a			3.47	0.07	3.47
410B2001	North Corner Under Metal Tray	2.5 - 3	1.47 ± 0.28	0.071 ± 0.025	2.55 ± 0.47
410B2002	South Corner Under Metal Tray	2 - 2.5	1.8 ± 0.34	0.0857 ± 0.028	5.66 ± 1
410B2003		2 - 2.5	1.75 ± 0.33	0.0891 ± 0.03	5.76 ± 1.1
410B2007	West Sidewall	2 - 3	1.22 ± 0.20	--	1.92 ± 0.29
410B2008	North Sidewall	2 - 3	1.72 ± 0.27	0.096 ± 0.042	4.18 ± 0.59
410B2009	East Sidewall	2 - 3	4.38 ± 0.65	0.41 ± 0.11	26 ± 3.5
410B2010	South Sidewall	2 - 3	1.31 ± 0.22	0.064 ± 0.034	1.74 ± 0.28
410B2011	Floor Southend	2 - 3	1.37 ± 0.22	0.12 ± 0.046	2.9 ± 0.43
410B2012	Floor Northend	2 - 3	2.11 ± 0.32	0.135 ± 0.049	5.61 ± 0.78
410B2013	East Sidewall	2 - 3	2.23 ± 0.35	0.279 ± 0.082	11 ± 1.5
410B2014	Stockpile location	0 - 0.5	2.36 ± 0.37	0.201 ± 0.070	10.2 ± 1.4
410B2015	Stockpile location	0 - 0.5	1.34 ± 0.24	0.119 ± 0.052	2.62 ± 0.41
410B2016	Stockpile location	0 - 0.5	1.21 ± 0.23	0.067 ± 0.036	1.99 ± 0.36
410B2017	Stockpile location	0 - 0.5	1.38 ± 0.26	0.16 ± 0.057	4.04 ± 0.68
410B2018	Stockpile location	0 - 0.5	1.05 ± 0.2	0.042 ± 0.026	1.14 ± 0.22
410B2019	Stockpile location	0 - 0.5	1.14 ± 0.22	0.078 ± 0.039	1.45 ± 0.27
410B2020	Stockpile location	0 - 0.5	0.97 ± 0.19	0.132 ± 0.051	1.14 ± 0.22
410B2021	Stockpile location	0 - 0.5	2.28 ± 0.4	0.207 ± 0.067	10.1 ± 1.6
410B2022	Stockpile location	0 - 0.5	1.26 ± 0.24	0.086 ± 0.042	1.41 ± 0.26
410B2023	Stockpile location	0 - 0.5	1.12 ± 0.21	--	1.2 ± 0.23
410B2024	East Sidewall/ Stockpile	0 - 0.5	1.41 ± 0.26	0.084 ± 0.039	2.23 ± 0.39
410B2034	Stockpile location	0 - 0.5	1.13 ± 0.20	0.067 ± 0.030	1.16 ± 0.21

^aBased on background concentration listed in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

-- = Not detected above minimum reporting limits

Table A.5-7
Solid Sample Results Detected Above
Minimum Reporting Limits at CAS TA-19-002-TAB2

Sample Number	Sample Matrix	Parameter	Results	Units	PALs
410B2006	Solid	Uranium-234	115 ± 50 (J) ^a	pCi/g	3.47 ^c
410B2006	Solid	Uranium-235	24 ± 13 (J) ^a	pCi/g	0.07 ^c
410B2006	Solid	Uranium-238	830 ± 350 (J) ^a	pCi/g	3.47 ^c
410B2006	Solid	Actinium-228	1.25 ± 0.25	pCi/g	3.64 ^c
410B2006	Solid	Bismuth-214	1.39 ± 0.26	pCi/g	3.47 ^c
410B2006	Solid	Potassium-40	9.7 ± 1.8	pCi/g	30.7 ^d
410B2006	Solid	Lead-212	1.28 ± 0.23	pCi/g	3.64 ^c
410B2006	Solid	Lead-214	1.46 ± 0.26	pCi/g	3.47 ^c
410B2006	Solid	Thorium-234	630 ± 100 (J) ^b	pCi/g	3.47 ^c
410B2006	Solid	Thallium-208	0.346 ± 0.077	pCi/g	3.38 ^c
410B2006	Solid	Uranium-235	8.6 ± 1.4 (J) ^b	pCi/g	0.07 ^c

^aQualifier added to laboratory data; record accepted. Chemical yield below control limits.

^bQualifier added to laboratory data; record accepted. Samples do not meet counting geometry requirements.

^cBased on background concentration reported in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

^dBased on background concentration listed or derived in *Off-Site Radiation Exposure Review Project, Phase II Soil Program* (McArthur and Miller, 1989)

pCi/g = Picocuries per gram

J = Estimated value

A.5.4.5 Gamma-Emitting Radionuclides

The gamma-emitting radionuclides results for soil samples collected from CAS TA-19-002-TAB2, which were detected above MRLs, are presented on [Table A.5-8](#). Except for thorium-234 and potassium-40, all gamma-emitting radionuclide results were below PALs (NNSA/NV, 2002a). Thorium-234 and potassium-40 were detected at concentrations exceeding and/or equal to the PALs; however, thorium-234 and potassium-40 analytical results were evaluated using the normalized difference test as discussed in [Section A.2.7](#). The thorium-234 and potassium-40 concentrations are considered indistinguishable from the PAL, except for the thorium-234 concentration for 410B2009 which is considered statistically above the PAL.

Table A.5-8
Soil Sample Results for Gamma-Emitting Radionuclides Detected
Above Minimum Reporting Limits at CAS TA-19-002-TAB2
(Page 1 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)									
			Actinium-228	Bismuth-214	Cesium-137	Lead-212	Lead-214	Potassium-40	Radium-226	Thallium-208	Thorium-232	Thorium-234
Preliminary Action Levels			3.64 ^a	3.47 ^a	7 ^b	3.64 ^a	3.47 ^a	30.7 ^b	3.47 ^a	3.38 ^a	3.64 ^a	3.47 ^a
410B2001	North Corner Under Metal Tray	2.5 - 3	1.59 ± 0.38	--	--	1.53 ± 0.29	1.27 ± 0.27	27.5 ± 4.1	--	--	2.02 ± 0.64	--
410B2002	South Corner Under Metal Tray	2 - 2.5	1.87 ± 0.45	1.44 ± 0.65	--	1.53 ± 0.3	1.49 ± 0.31	28.7 ± 4.2	1.46 ± 0.27	0.698 ± 0.14	2.04 ± 0.72	--
410B2003		2 - 2.5	--	--	--	2.15 ± 0.5	1.21 ± 0.32	30.7 ± 4.4	--	--	1.6 ± 0.66	--
410B2004	Thirty Ft West of Debris Pile	0 - 0.5	2.05 ± 0.42	--	--	1.73 ± 0.31	1.46 ± 0.28	26.1 ± 3.9	--	0.58 ± 0.14	1.67 ± 0.54	--
410B2005	Near West Corner of Metal Tray	0 - 0.5	--	--	0.392 ± 0.14 (J)	1.91 ± 0.37	1.77 ± 0.36	28.6 ± 4.4	--	--	1.77 ± 0.91	--
410B2007	West Sidewall	2 - 3	1.75 ± 0.41	1.02 ± 0.25	--	1.74 ± 0.34	1.11 ± 0.25	27.7 ± 5.2	--	0.48 ± 0.13	--	--
410B2008	North Sidewall	2 - 3	1.72 ± 0.43	0.98 ± 0.27	--	1.79 ± 0.36	1.14 ± 0.26	28 ± 5.4	--	0.59 ± 0.15	--	5 ± 1.9
410B2009	East Sidewall	2 - 3	1.69 ± 0.39	1.12 ± 0.27	--	1.68 ± 0.34	1.25 ± 0.27	26.3 ± 5.0	--	0.54 ± 0.14	--	20.4 ± 4.0
410B2010	South Sidewall	2 - 3	1.25 ± 0.35	0.89 ± 0.25	--	1.7 ± 0.34	1.08 ± 0.25	26.4 ± 5.2	--	0.57 ± 0.15	--	--

Table A.5-8
Soil Sample Results for Gamma-Emitting Radionuclides Detected
Above Minimum Reporting Limits at CAS TA-19-002-TAB2
(Page 2 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)									
			Actinium-228	Bismuth-214	Cesium-137	Lead-212	Lead-214	Potassium-40	Radium-226	Thallium-208	Thorium-232	Thorium-234
Preliminary Action Levels			3.64 ^a	3.47 ^a	7 ^b	3.64 ^a	3.47 ^a	30.7 ^b	3.47 ^a	3.38 ^a	3.64 ^a	3.47 ^a
410B2011	Floor Southend	2 - 3	1.56 ± 0.37	0.96 ± 0.25	--	1.53 ± 0.31	1.1 ± 0.24	26.4 ± 5.0	--	0.61 ± 0.15	--	--
410B2012	Floor Northend	2 - 3	1.33 ± 0.41	0.96 ± 0.28	--	1.73 ± 0.36	1.24 ± 0.28	24.9 ± 5.0	--	0.53 ± 0.15	--	6.6 ± 2.0

^aBased on background concentrations reported in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

^bBased on background concentration listed or derived in *Off-Site Radiation Exposure Review Project, Phase II Soil Program* (McArthur and Miller, 1989)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

-- = Not detected above minimum reporting limits

A.5.5 *Contaminants of Concern*

Analytical results of the unknown solid material and FSRs confirmed the presence of DU within the buried soil and debris of CAS TA-19-002-TAB2. No other COCs were identified. A detection of PCBs (Aroclor-1254) was identified; however, it was below PALs and therefore not considered a COC. Based on the analytical results from final verification samples, there are no COCs identified in remaining soil.

A.5.6 *Nature and Extent of Contamination*

Investigation results indicate that DU contamination was primarily confined to the interior of the metal pan object. The vertical and lateral extent of DU contamination was delineated following the excavation, removal, and segregation of the soil, debris, and metal pan from the subsurface. Analytical results from confirmation samples collected from the floor and sidewalls of the excavation following the removal of the metal pan, as well as the verification samples collected from the former stockpile area, indicate there are no COCs remaining at this site.

A.5.7 *Revised Conceptual Site Model*

No variations to the CSM were identified.

A.6.0 CAS TA-21-002-TAAL, Disposal Trench (Antelope Lake)

This CAS is located in the southwestern corner of Antelope Lake on the playa and adjacent to the start of vegetation. Prior to the investigation, the site dimension was given as 880 ft in diameter (based on disturbed soils) and included a soil mound on the eastern end of the site. There was miscellaneous debris scattered throughout the site, including wood, metal, and UXO. Geophysical surveys identified four areas of subsurface debris; although, there was no obvious trench configuration visible from the surface.

Prior to intrusive activities, UXO personnel performed an avoidance survey around the CAS footprint to identify any potential UXO and mark out the work area to protect the health and safety of workers.

A.6.1 Corrective Action Investigation

A total of 26 environmental soil samples were collected by hand or backhoe and submitted for laboratory analyses. In addition, three QC field duplicates, two QC field blanks, one QC equipment rinsate blank, one source blank, and eight QC trip blanks were collected and submitted for laboratory analysis. A list of the samples collected and the parameters analyzed for are presented [Table A.6-1](#).

[Table A.6-1](#) also provides sample information on the 23 waste management soil samples collected and submitted for analysis. Although presented in this table for completeness, discussion regarding sample collection and the waste management analytical results are provided in [Appendix D](#).

A.6.2 CAIP Implementation

The following CAI activities were performed to meet the CAIP requirements:

- Excavated within the footprint of the geophysical anomaly to identify nature and extent of buried materials
- Field screened soils for alpha and beta/gamma radiation and HES
- Collected subsurface samples at the native soil interface beneath debris
- Collected multiple confirmation samples from the excavation
- Segregated and separated soil, debris, and UXO for proper waste disposal
- Conducted waste characterization sampling for waste profiles
- Disposed of all IDW from the site including the demilitarization of potentially live ordnance
- Collected verification soil samples following disposal of the DU-contaminated stockpile
- Backfilled the excavation with clean fill

Table A.6-1
Samples Collected for CAS TA-21-002-TAAL, Disposal Trench
(Page 1 of 3)

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
410AL001	11/4/2002	East End of Trench #2	5.5 - 6	Soil	SC	Set 2
410AL002	11/5/2002	West End of Trench #3	7.5 - 8	Soil	SC	Set 2
410AL003			7.5 - 8	Soil	Field Duplicate of #410AL002	Set 2
410AL004	3/13/2003	East Sidewall	6 - 7	Soil	Confirmation	Set 2
410AL005		Floor - Southend	6 - 7	Soil	Confirmation	Set 2
410AL006		West Sidewall	6 - 7	Soil	Confirmation	Set 2
410AL007		South Sidewall	6 - 7	Soil	Confirmation	Set 2
410AL008			6 - 7	Soil	Confirmation	Set 2
410AL009	3/15/2003	Floor Northend	10 - 11	Soil	Confirmation	Set 2
410AL010			10 - 11	Soil	Confirmation	Set 2
410AL011	3/16/2003	North Sidewall	10 - 11	Soil	Confirmation	Set 2
410AL012			10 - 11	Soil	Field Duplicate of #410AL011	Set 2
410AL013		East Sidewall	10 - 11	Soil	Confirmation, Lab QC	Set 2
410AL014	3/20/2003	West Sidewall	3	Soil	Confirmation	Set 2
410AL015		Floor Northend	10 - 11	Soil	Confirmation	Set 2
410AL016		North Sidewall	10 - 11	Soil	Confirmation	Set 2
410AL017	9/11/2003	Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL018	9/11/2003	Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL019	9/11/2003	Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL020	9/11/2003	Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL021	10/14/2003	Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL022		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL023		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL024		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL025		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL026		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL027		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL028		Stockpile location	0 - 0.5	Soil	Confirmation	Isotopic uranium
410AL029		Stockpile location	0 - 0.5	Soil	Field Duplicate of #410AL028	Isotopic uranium

Table A.6-1
Samples Collected for CAS TA-21-002-TAAL, Disposal Trench
(Page 2 of 3)

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
410AL301	11/4/2002	NA	NA	Water	Trip Blank	Total VOCs
410AL302	11/5/2002	NA	NA	Water	Field Blank	Set 2
410AL303	3/13/2003	NA	NA	Water	Trip Blank	Total VOCs
410AL304		NA	NA	Water	Source Blank	Set 5
410AL305	3/15/2003	NA	NA	Water	Trip Blank	Total VOCs
410AL306	3/16/2003	NA	NA	Water	Equipment Rinsate Blank	Set 5
410AL307		NA	NA	Water	Trip Blank	Total VOCs
410AL308		NA	NA	Water	Trip Blank	Total VOCs
410AL309	3/20/2003	NA	NA	Water	Trip Blank	Total VOCs
410AL310	3/25/2003	NA	NA	Water	Trip Blank	Total VOCs
410AL311	3/26/2003	NA	NA	Water	Trip Blank	Total VOCs
410AL312	10/14/2003	Stockpile location	NA	Water	Field Blank	Isotopic uranium
410AL501	3/25/2003	NA	NA	Soil	WM	Set 2
410AL502		NA	NA	Soil	WM	Set 2
410AL503		NA	NA	Soil	WM	Set 5
410AL504		NA	NA	Soil	WM	Set 2
410AL505		NA	NA	Soil	WM	Set 5
410AL506		NA	NA	Soil	WM	Set 2
410AL507		NA	NA	Soil	WM	Set 5
410AL508		NA	NA	Soil	WM	Set 2
410AL509		NA	NA	Soil	WM	Set 2
410AL510		NA	NA	Soil	WM	Set 2
410AL511	3/25/2003	NA	NA	Soil	WM	Set 2
410AL512		NA	NA	Soil	WM	Set 2
410AL513		NA	NA	Soil	WM	Set 5
410AL514		NA	NA	Soil	WM	Set 2
410AL515		NA	NA	Soil	WM	Set 2
410AL516		NA	NA	Soil	WM	Set 2
410AL517		NA	NA	Soil	WM	Set 5
410AL518		NA	NA	Soil	WM	Set 2
410AL519		NA	NA	Soil	WM	Set 2

Table A.6-1
Samples Collected for CAS TA-21-002-TAAL, Disposal Trench
(Page 3 of 3)

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
410AL520	3/26/2003	NA	NA	Soil	WM	Set 2
410AL521		NA	NA	Soil	WM	Set 5
410AL522	10/14/2003	NA	NA	Soil	WM	Isotopic uranium

Set 2 = Total VOCs, Total SVOCs, Total RCRA Metals, High Explosives, Total Beryllium, Gamma Spectrometry, TPH (DRO-GRO), Isotopic Uranium, and Isotopic Plutonium

Set 5 = Total VOCs, Total SVOCs, Total RCRA Metals, High Explosives, Total Beryllium, Gamma Spectrometry, TPH (DRO-GRO), Isotopic Uranium, Isotopic Plutonium, PCBs, Pesticides, and Herbicides

SC = Site characterization

NA = Not applicable

QC = Quality control

WM = Waste management

ft bgs = Feet below ground surface

A.6.2.1 Deviations

During the initial CAU investigation activities conducted in October and November 2002, the excavation activities did not define the horizontal and vertical extent of the debris due to the nature of the materials and the capability of the equipment. The buried debris, which consisted of a variety of material including metallic debris, UXO, and steel wire, was greater in vertical and lateral extent than previously thought. At the completion of this initial phase, two soil samples (410AL001 and 410AL002) were collected from the southern and northern trenches and submitted for analysis.

It was proposed in ROTC No. 2 to the CAIP that additional excavation be completed as a supplemental field activity to the CAIP/DQO process and to include the excavation, segregation, and separation of soil, debris, and UXO. These additional excavation activities commenced on March 11, 2003, and were completed on March 20, 2003. During these excavation activities, the soils in the excavation were field screened for RDX. The FSRs indicated that RDX was not above the FSLs in the soils. Therefore, the limits of the excavation were defined by the presence of UXO, as well as the presence of DU in soil and debris. Based on the historical data review for the CAIP, it was not anticipated that DU would be present at CAS TA-21-002-TAAL. Further segregation of the soils and debris from the DU-impacted material was implemented.

A.6.3 Investigation Activities

The following sections provide CAS-specific details of excavation, field screening, and sample collection and analysis. The various phases of the initial and supplemental activities for CAS TA-21-002-TAAL are summarized in [Table A.6-2](#).

Table A.6-2
Summary of Excavation Activities at CAS TA-21-002-TAAL

Date of Activities	Activity Summary
November 4 to 5, 2002	Three trenches excavated and/or potholed within the geophysical anomaly and confirmed debris and UXO are present in subsurface. Samples 410AL001 to 410AL003 were collected for characterization.
March 11 to 16, 2003	Supplemental field activities started with excavation of soil, debris, and UXO from the subsurface. All IDW was segregated and stockpiled. Confirmation samples 410AL004 to 410AL013 were collected from the sidewalls and floor of portions of completed excavation. On March 16, DU contamination was encountered and work suspended for health and safety reasons.
March 19 and 20, 2003	Activities were resumed under an RWP and the excavation of all debris and UXO was completed. Confirmation samples 410AL013 to 410AL016 were collected from remaining sidewalls and floor of completed excavation.
March 25 and 26, 2003	A total of 21 waste characterization samples were collected from the soil stockpiles.
April 24 to July 17, 2003	Five separate episodes of UXO demilitarization activities were conducted (see Appendix D).
September 11, 2003	The last UXO demilitarization activity was conducted. Verification samples 410AL017 to 410AL020 were collected from the former DU-stockpile staging areas. Results from sample 410AL018 indicated that DU-contamination was still present above PALs.
October 14, 2003	Additional soil was removed from the former DU-stockpile staging areas based on 410AL018. Nine additional verification samples (410AL021 to 410AL029) were collected and results indicate remaining soil is below PALs. Summary: All soils associated with uranium results above PALs from the former stockpile areas have been excavated and removed for disposal and the most recent verification samples indicate remaining soil is below PALs.

A.6.3.1 Field Screening

Field screening was performed as specified in the CAIP (NNSA/NV, 2002a). Samples were field screened for alpha and beta/gamma-emitting radionuclides and HEs. Established FSLs were used to guide sample collection, guide excavation activities, and provide a basis for the selection of additional environmental samples for laboratory analyses. High explosives field screening was performed on soil collected from within the excavation and from stockpiled soil. All FSRs were below established FSLs for HE.

Radiological field screening was conducted throughout the investigation on soil and solid materials whenever UXO personnel would stop excavation activities and allow nonessential personnel within the exclusion zone. All FSRs were below FSLs until DU contamination was encountered on the

north sidewall of the excavation at which time field-screening intervals were increased during the UXO excavation activities to delineate lateral and vertical contamination. Radiological field screening and surveys were performed on solid materials for waste management purposes. All confirmation samples collected from the floor and sidewalls of the excavation had FSRs below the FSLs.

A.6.3.2 Excavation

Due to safety concerns for potential UXO hazards within the disposal trench, only essential personnel were allowed within the established EZ (approximate 4,000-ft radius) and all excavation activities were performed by qualified UXO personnel. A backhoe was used to excavate small lifts of material for inspections by UXO personnel. If UXO was identified, it was segregated from soil and debris. During the CAU investigation activities conducted on November 4 and 5, 2002, the initial excavation of three trenches confirmed the presence of subsurface debris and ordnance within the footprint of the geophysical anomaly. The buried debris consisted of a variety of material including metallic debris, UXO, plastic, wood, and cables ([Figure A.6-1](#)). Initial field screening for HE indicated FSRs below the FSLs. Due to the nature and size of the materials and UXO encountered, the vertical and lateral extent of potential contamination could not be determined. All UXO and noncontaminated scrap debris were temporarily stockpiled within a soil berm for future disposal and excavations were backfilled pending supplemental field activities to fully characterize the subsurface soil.

In accordance with ROTC No. 2 to the CAIP, which outlines the proposed excavation, segregation, and separation of soil, debris, and UXO, further excavation activities were completed as a supplemental field activity to further define and delineate the nature and extent of potential contamination. These additional excavation activities commenced on March 11, 2003, and were completed on March 20, 2003. Excavation activities started near the initial southern trench previously excavated in November 2002. This location correlates with the southern boundary of the geophysical anomaly. During these excavation activities, HE and radiological field screening was performed on the soils within the excavation. Because FSRs indicated that soil was not above the FSLs, excavation was guided by the presence of UXO and/or debris. As the excavation progressed northward based on the presence of debris and UXO, DU contamination was

Figure A.6-1
Antelope Lake Debris
(Scrap debris typical of trench contents,
photo taken November 2002)

encountered on subsurface soil and debris located in the central to western portion of the existing north wall. The detection of DU warranted further segregation of the soils and debris to separate out the DU-impacted material. To delineate the extent of DU contamination, the excavation activities continued northward until FSRs indicated that remaining soil and debris in the subsurface was below radiological FSLs.

As the excavation progressed, soil confirmation samples (410AL004 through 410AL016) were collected from the floor and sidewalls. These samples confirmed that the lateral and vertical extent of contamination within the disposal trench was delineated and that further excavation was not warranted. The confirmation sampling locations are presented on [Figure A.6-2](#). The sample locations are field-located measurements relative to the sidewalls and center berm due to safety concerns on collecting GPS points within the excavation. [Figure A.6-3](#) shows the historical disposal trench following excavation/characterization activities prior to backfilling.

Initial surface verification samples collected in September 2003 from the former DU-waste stockpile staging areas indicated concentrations of DU above the PAL remained

Figure A.6-2
CAU 410, CAS TA-21-002-TAAL, Soil Sampling Locations

Figure A.6-3
Antelope Lake Excavation
(Excavation after removal of debris,
photo taken March 2003)

(sample 410AL018). Additional soil was removed on October 14, 2003, and another nine verification samples (410AL021 to 410AL029) were collected and submitted for isotopic uranium laboratory analysis. Statistical analysis of these most recent analytical results, using the normalized difference test, indicate uranium concentrations in the remaining soil are below PALs.

A.6.3.3 Waste Characterization

Waste management samples were collected from all stockpiled soil on site and submitted for laboratory analyses of COPCs. Debris, ordnance, and DU-contaminated soil were characterized by radiological surveys and sampling. The DU-contaminated materials were separated and segregated prior to loading into waste disposal containers. All DU waste that was loaded into approved containers during September 2003 was transported for disposal at the Area 3 and Area 5 RWMS at the NTS. The additional soil removed on October 14, 2003, was disposed at the U10C disposal site at the NTS. Nonhazardous waste that was excavated, segregated, and stockpiled was loaded into

haul trucks and disposed at the TTR construction landfill. The excavation was backfilled with native soil from the TTR borrow pit.

In addition to soil and debris IDW generated during excavation activities at this site, over 1,000 pieces of UXO were identified and segregated from the rest of the debris and contained within established HWAAs pending disposal. Numerous types of ordnance were identified including Beehives, SUSS rounds, 155- and 105-millimeter (mm) rounds, TDD fuses, BLU 63s, Mark 84 (2,000-pound [lb]) and Mark 82 (500-lb) bombs, dispensers, strong backs (actual type unknown), drill rounds, and a 2,000-lb sea mine (later categorized as a Mark 84). Of the approximately 1,000 pieces of UXO, a total of 195 potentially live UXO (as determined by USAF EOD personnel) were demilitarized on site ([Figure A.6-4](#)). Forty-six pieces of UXO had fixed DU; therefore, were demilitarized by USAF EOD and Shaw UXO personnel to qualify for final disposition into the NTS LLW disposal site. Any ordnance determined to be inert by USAF EOD personnel (e.g., beehives) were moved to the USAF recycle pile. These activities were conducted in accordance with ROTC No. 4 to the CAIP, which outlined the removal of UXO and ordnance debris from CAS TA-21-002-TAAL, Disposal Trench. The UXO and debris disposal activities are described in greater detail in [Appendix D](#).

A.6.3.4 Sample Analysis

Investigation and verification soil samples from both the initial and supplemental investigations were submitted for analysis including total VOCs, total SVOCs, total RCRA metals, HEs, total beryllium, gamma spectrometry, TPH-DRO and -GRO, isotopic uranium, and isotopic plutonium. The only exception is for verification samples collected after the removal of the DU-waste stockpile (410AL017 through 410AL029) which were analyzed for isotopic uranium only.

A.6.4 Analytes Detected Above MRL

The analytical results detected at concentrations exceeding the correlated MRLs at this CAS are summarized in the following sections.

Figure A.6-4
Antelope Lake UXO
(Demilitarized UXO at Antelope Lake,
photo taken May 2003)

A.6.4.1 Total VOCs

The total VOC results for soil samples collected from CAS TA-21-002-TAAL, which were detected above MRLs, are presented on [Table A.6-3](#). All total VOC results are below PALs (NNSA/NV, 2002a).

A.6.4.2 Total Metals

The total metals results for soil samples collected from CAS TA-21-002-TAAL, which were detected above MRLs, are presented on [Table A.6-4](#). Except for arsenic, all of the total metals results are below PALs (NNSA/NV, 2002a). The arsenic concentrations that exceed the PAL are within the TTR background range and considered representative of ambient conditions.

Table A.6-3
Soil Sample Results for Total VOCs
Detected Above Minimum Reporting Limits at CAS TA-21-002-TAAL

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (µg/kg)
			Acetone
Preliminary Action Levels ^a			6,200,000
410AL012	North Sidewall	10 - 11	30

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals* (PRGs) (EPA, 2000b)

ft bgs = Feet below ground surface

µg/kg = Micrograms per gram

-- = Not detected above minimum reporting limits

A.6.4.3 Isotopic Uranium Results

The isotopic uranium results for soil samples collected from CAS TA-21-002-TAAL, which were detected above MRLs, are presented on [Table A.6-5](#). Several confirmation samples had U-234 and U-235 concentrations exceeding the respective PALs. Uranium-234 and U-235 analytical results were evaluated using the normalized difference test as discussed in [Section A.2.7](#), and the concentrations in samples 410AL004 through 410AL012, and samples 410AL014 through 410AL029 were considered indistinguishable from the PALs. The only exception was confirmation sample 410AL018, which has U-235 and U-238 concentrations considered statistically above the PAL. This sample represents the ground surface beneath the former DU-waste stockpile. See [Section A.6.3.2](#) for details regarding additional soil removal and sampling.

A.6.4.4 Gamma-Emitting Radionuclides Results

The gamma-emitting radionuclide results for soil samples collected from CAS TA-21-002-TAAL, which were detected above MRLs, are presented on [Table A.6-6](#). Except for bismuth-212, potassium-40, and thorium-234, the gamma-emitting radionuclides were below PALs (NNSA/NV, 2002a). Several confirmation samples had bismuth-212, potassium-40, and thorium-234 concentrations exceeding the respective PALs. These analytical results were evaluated using the normalized difference test as discussed in [Section A.2.7](#), and the concentrations in these samples are considered indistinguishable from the PALs.

Table A.6-4
Soil Sample Results for Total Metals Detected
Above Minimum Reporting Limits at CAS TA-21-002-TAAL

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (mg/kg)					
			Arsenic	Barium	Beryllium	Chromium	Lead	Selenium
Preliminary Action Levels ^a			23 ^b	100,000	2,200	450	750	10,000
410AL001	East End of Trench #2	5.5 - 6	11.5	147	--	12.4	14.8	--
410AL002	West End of Trench #3	7.5 - 8	12.4	183	--	14.1	15.8	--
410AL003		7.5 - 8	12.1	177	--	14.3	15.9	--
410AL004	East Sidewall	6 - 7	34	180	2	13	19	--
410AL005	Floor - Southend	6 - 7	26	400	1.8	13	18	1.1 (B)
410AL006	West Sidewall	6 - 7	19	200	1.6	12	18	--
410AL007	South Sidewall	6 - 7	28	370	2	13	18	--
410AL008		6 - 7	29	690	2	14	19	--
410AL009	Floor Northend	10 - 11	17	460	1.9	13 (J)	17	--
410AL010		10 - 11	23	260	1.8	13 (J)	18	--
410AL011	North Sidewall	10 - 11	15	220	1.9	13 (J)	18	1.2
410AL012		10 - 11	15	190	1.8	12 (J)	18	--
410AL013	East Sidewall	10 - 11	15	250	1.9	13 (J)	17	--
410AL014	West Sidewall	3	13	180	1.9	12 (J)	15	--
410AL015	Floor Northend	10 - 11	22	470	1.9	12 (J)	17	--
410AL016	North Sidewall	10 - 11	33	360	2	13 (J)	18	--

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

^bBased on background concentrations for metals. Background is considered the mean plus two standard deviation for sediment samples collected by the Nevada Bureau of Mines and Geology throughout the Nevada Test and Training Range (NBMG, 1998; Moore, 1999).

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

-- = Not detected above minimum reporting limits

B = Value less than the instrument detection limit, but greater than or equal to the contract-required detection limit.

J = Estimated value. Qualifier added to laboratory data; record accepted. Serial dilution %D outside control limits. Matrix effects may exist.

A.6.5 Contaminants of Concern

Depleted uranium is identified as a COC based on waste characterization soil samples that represent the DU waste disposed as LLW. Based on the analytical results from the verification samples, there are no COCs identified in remaining soil.

Table A.6-5
Soil Sample Results for Isotopes Detected
Above Minimum Reporting Limits at CAS TA-21-002-TAAL
(Page 1 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)		
			Uranium-234 ^b	Uranium-235 ^b	Uranium-238 ^b
Preliminary Action Levels			3.47	0.07	3.47
410AL001	East End of Trench #2	5.5 - 6	2.21 ± 0.41	0.0783 ± 0.026	1.77 ± 0.33
410AL002	West End of Trench #3	7.5 - 8	2.05 ± 0.39	0.0785 ± 0.027	1.79 ± 0.34
410AL003		7.5 - 8	1.97 ± 0.37	0.0545 ± 0.021	1.66 ± 0.31
410AL004	East Sidewall	6 - 7	4.2 ± 0.59	0.2 ± 0.061	3.1 ± 0.45
410AL005	Floor - Southend	6 - 7	3.7 ± 0.53	0.156 ± 0.054	2.79 ± 0.41
410AL006	West Sidewall	6 - 7	2.94 ± 0.43	0.128 ± 0.049	2.3 ± 0.35
410AL007	South Sidewall	6 - 7	3.63 ± 0.56	0.124 ± 0.048	2.97 ± 0.47
410AL008		6 - 7	4.05 ± 0.62	0.143 ± 0.051	3.26 ± 0.50
410AL009	Floor Northend	10 - 11	2.34 ± 0.37	0.13 ± 0.048	2.07 ± 0.33
410AL010		10 - 11	2.79 ± 0.44	0.148 ± 0.053	2.31 ± 0.37
410AL011	North Sidewall	10 - 11	2.62 ± 0.41	0.117 ± 0.045	2.11 ± 0.34
410AL012		10 - 11	3.04 ± 0.47	0.131 ± 0.048	2.32 ± 0.37
410AL013	East Sidewall	10 - 11	2.98 ± 0.47	0.075 ± 0.037	2.17 ± 0.36
410AL014	West Sidewall	3	1.62 ± 0.27	0.08 ± 0.038	1.33 ± 0.23
410AL015	Floor Northend	10 - 11	2.75 ± 0.43	0.115 ± 0.045	2.24 ± 0.36
410AL016	North Sidewall	10 - 11	4.15 ± 0.64	0.177 ± 0.060	3.06 ± 0.48
410AL017	Stockpile location	0 - 0.5	1.6 ± 0.27	0.102 ± 0.046	3.37 ± 0.50
410AL018	Stockpile Location	0 - 0.5	3.13 ± 0.48	0.297 ± 0.087	14.6 ± 2.0
410AL019	Stockpile Location	0 - 0.5	1.77 ± 0.29	0.1 ± 0.046	4.48 ± 0.65
410AL020	Stockpile Location	0 - 0.5	1.84 ± 0.30	0.108 ± 0.047	4 ± 0.58
410AL021	Stockpile Location	0 - 0.5	1.07 ± 0.21	--	1.14 ± 0.22
410AL022	Stockpile Location	0 - 0.5	1.18 ± 0.22	0.069 ± 0.035	1.36 ± 0.25
410AL023	Stockpile Location	0 - 0.5	1.1 ± 0.22	--	1.11 ± 0.22
410AL024	Stockpile Location	0 - 0.5	1.11 ± 0.21	--	0.97 ± 0.19
410AL025	Stockpile Location	0 - 0.5	1.06 ± 0.21	0.086 ± 0.041	1.1 ± 0.21

Table A.6-5
Soil Sample Results for Isotopes Detected
Above Minimum Reporting Limits at CAS TA-21-002-TAAL
(Page 2 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)		
			Uranium-234 ^b	Uranium-235 ^b	Uranium-238 ^b
Preliminary Action Levels			3.47	0.07	3.47
410AL026	Stockpile Location	0 - 0.5	1.13 ± 0.22	0.099± 0.043	1.04 ± 0.2
410AL027	Stockpile Location	0 - 0.5	1.13 ± 0.22	0.055 ± 0.031	1.17 ± 0.22
410AL028	Stockpile Location	0 - 0.5	1.22 ± 0.24	--	1.02 ± 0.2
410AL029	Stockpile Location	0 - 0.5	1.39 ± 0.26	0.103 ± 0.046	1.18 ± 0.23

^aBased on background concentration listed or derived in *Off-Site Radiation Exposure Review Project, Phase II Soil Program* (McArthur and Miller, 1989)

^bBased on background concentration listed in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

-- = Not detected above minimum reporting limits

A.6.6 Nature and Extent of Contamination

The nature and extent of DU-contaminated soil, miscellaneous debris, and UXO was delineated through excavation, removal, and segregation of all materials from the historical disposal trench. Analytical results from confirmation samples collected from the excavation floors and sidewalls indicate there are no COCs remaining at this site.

A.6.7 Revised Conceptual Site Model

The only significant variation to the CSM was the identification of depleted uranium contamination within the disposal trench; however, no variations to the CSM were identified for migration or exposure pathways.

Table A.6-6
Soil Sample Results for Gamma-Emitting Radionuclides
Detected Above Minimum Reporting Limits at CAS TA-21-002-TAAL
(Page 1 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)									
			Actinium-228	Bismuth-212	Bismuth-214	Lead-212	Lead-214	Potassium-40	Radium-226	Thallium-208	Thorium-232	Thorium-234
Preliminary Action Levels			3.64 ^a	3.64 ^a	3.47 ^a	3.64 ^a	3.47 ^a	30.7 ^b	3.47 ^a	3.38 ^a	3.64 ^a	3.47 ^a
410AL001	East end of Trench #2	5.5 - 6	2.51 ± 0.57	--	--	1.62 ± 0.41	2.01 ± 0.41	32.6 ± 4.7	--	0.776 ± 0.18	2.6 ± 0.84	--
410AL002	West End of Trench #3	7.5 - 8	1.76 ± 0.55	--	--	2.34 ± 0.43	2.14 ± 0.46	30.5 ± 4.5	1.91 ± 0.39	0.658 ± 0.17	2.42 ± 0.84	--
410AL003		7.5 - 8	1.93 ± 0.53	--	--	2.29 ± 0.44	1.85 ± 0.4	29.5 ± 4.5	--	0.78 ± 0.19	2.65 ± 0.8	--
410AL004	East Sidewall	6 - 7	2.04 ± 0.52	--	2.26 ± 0.52	2.16 ± 0.44	2.44 ± 0.48	29.8 ± 6.0	--	0.76 ± 0.2	--	--
410AL005	Floor - Southend	6 - 7	1.67 ± 0.48	--	1.99 ± 0.47	2.27 ± 0.46	2.04 ± 0.43	31.1 ± 6.4	--	0.89 ± 0.22	--	--
410AL006	West Sidewall	6 - 7	1.89 ± 0.46	--	1.79 ± 0.40	2.16 ± 0.42	1.92 ± 0.39	30.2 ± 5.9	--	0.76 ± 0.19	--	--
410AL007	South Side-wall	6 - 7	2.14 ± 0.56	--	2.05 ± 0.49	2.39 ± 0.48	2.14 ± 0.44	26.4 ± 5.5	--	0.77 ± 0.21	--	--
410AL008		6 - 7	2.01 ± 0.50	4 ± 1.6	1.78 ± 0.42	2.11 ± 0.43	2.06 ± 0.42	28.8 ± 5.8	--	0.55 ± 0.18	--	3.5 ± 1.2
410AL009	Floor Northend	10 - 11	2.16 ± 0.55	--	1.66 ± 0.40	2.17 ± 0.45	1.71 ± 0.38	32.6 ± 6.4	--	0.76 ± 0.20	--	--
410AL010		10 - 11	1.92 ± 0.54	--	2.1 ± 0.50	2.73 ± 0.55	2.08 ± 0.45	32.4 ± 6.6	--	0.68 ± 0.21	--	--
410AL011	North Sidewall	10 - 11	2.1 ± 0.52	--	2 ± 0.44	2.29 ± 0.46	2.07 ± 0.42	31.9 ± 6.2	--	0.61 ± 0.18	--	--
410AL012		10 - 11	1.74 ± 0.49	--	1.85 ± 0.46	2.23 ± 0.46	1.99 ± 0.42	28 ± 5.8	--	0.63 ± 0.18	--	--
410AL013	East Sidewall	10 - 11	2.16 ± 0.46	--	1.77 ± 0.36	2.29 ± 0.42	2.09 ± 0.39	34.5 ± 6.1	--	0.75 ± 0.16	--	--

Table A.6-6
Soil Sample Results for Gamma-Emitting Radionuclides
Detected Above Minimum Reporting Limits at CAS TA-21-002-TAAL
(Page 2 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)									
			Actinium-228	Bismuth-212	Bismuth-214	Lead-212	Lead-214	Potassium-40	Radium-226	Thallium-208	Thorium-232	Thorium-234
Preliminary Action Levels			3.64 ^a	3.64 ^a	3.47 ^a	3.64 ^a	3.47 ^a	30.7 ^b	3.47 ^a	3.38 ^a	3.64 ^a	3.47 ^a
410AL014	West Sidewall	3	1.59 ± 0.43	--	1.25 ± 0.32	2.34 ± 0.46	1.44 ± 0.32	28.6 ± 5.7	--	0.6 ± 0.17	--	--
410AL015	Floor Northend	10 - 11	1.75 ± 0.55	--	1.96 ± 0.49	2.37 ± 0.49	2.16 ± 0.46	25.4 ± 5.4	--	0.6 ± 0.19	--	--
410AL016	North Sidewall	10 - 11	1.78 ± 0.51	3.8 ± 1.5	2.63 ± 0.57	2.42 ± 0.48	2.89 ± 0.56	25.8 ± 5.4	--	0.78 ± 0.21	--	5.7 ± 2.1 (TI)

^aBased on background concentration reported in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

^bBased on background concentration listed or derived in *Off-Site Radiation Exposure Review Project, Phase II Soil Program* (McArthur and Miller, 1989)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

-- = Not detected above minimum reporting limits

TI = Tentatively identified

A.7.0 CAS 03-19-001, Waste Disposal Site

This CAS is located within the Area 3 compound in the northwestern corner. This site was identified based on the CAU 405 investigation of a septic system where debris and elevated TPH FSRs were identified at a depth of 4.5- to 5-ft bgs and approximately 15-ft south of the CAU 405 investigation. Prior to the investigation, there was no surface debris present and subsurface geophysical survey results were inclusive. The site is bounded physically by the Area 3 perimeter fence to the west, Building 0385 on the north, and the current CAU 424 use-restriction for a landfill on the south. The CAU 424 use restriction was not entered during the investigation of this CAS.

A.7.1 Corrective Action Investigation

A total of 40 (5 site characterization, 34 confirmation, and 1 background) environmental soil samples were collected and submitted for laboratory analyses. Four QC duplicate samples, one QC field blank, one QC equipment rinsate blank, two source blanks, and 15 QC trip blanks were collected and submitted for laboratory analysis. A list of the samples collected and the parameters analyzed for are presented in [Table A.7-1](#).

[Table A.7-1](#) also provides sample information on the 11 waste management soil samples collected and submitted for analysis. Although presented in this table for completeness, discussion regarding sample collection and the waste management analytical results are provided in [Appendix D](#).

A.7.2 CAIP Implementation

The following CAI activities were performed to meet the CAIP requirements:

- Excavated within the CAS footprint to identify nature and extent of TPH-contaminated soils and buried burn pit materials
- Field screened soils for alpha and beta/gamma radiation and TPH
- Collected biased subsurface samples within the burn pit materials
- Collected confirmation samples from the excavation sidewalls and floor
- Segregated and separated soil and debris for proper waste disposal
- Conducted waste characterization sampling
- Disposed of all IDW from the site and backfilled the excavation with clean fill

Table A.7-1
Samples Collected for CAS 03-19-001, Waste Disposal Site
(Page 1 of 3)

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
41003001	10/29/2002	Excavation 1	4.5 - 5	Soil	SC, Lab QC	TPH-DRO
41003002		Excavation 2	4.5 - 5	Soil	SC	TPH-DRO
41003003		Excavation 3	4.5 - 5	Soil	SC	TPH-DRO
41003004			4.5 - 5	Soil	Field Duplicate of #41003003	TPH-DRO
41003005		Excavation 5	4.5 - 5	Soil	SC	TPH-DRO
41003006		Excavation 4	4.5 - 5	Soil	SC	TPH-DRO
41003006A	3/4/2003	North Sidewall - Burn Pit	4.5 - 5	Soil	Confirmation, WM	Set 4
41003007			4.5 - 5	Soil	Confirmation, WM	Set 4
41003008			4.5 - 5	Soil	Field Duplicate of #41003007	Set 4
41003009	3/24/2003	Pothole #2	7	Soil	Confirmation	Set 5
41003010			0 - 1	Soil	Confirmation	Set 5
41003011	3/25/2003	Pothole #3	7	Soil	Confirmation	Set 5
41003012	3/27/2003	South Sidewall - Burn Pit	4 - 5	Soil	Confirmation	Set 6
41003013		West Sidewall - Burn Pit	6 - 7	Soil	Confirmation	Set 6
41003014		North Sidewall - Burn Pit	8 - 9	Soil	Confirmation	Set 6
41003015	4/9/2003	Boring B01	12 - 13.5	Soil	Confirmation	Set 7
41003016			17 - 18.5	Soil	Confirmation	Set 7
41003017		Boring B02	8 - 9.5	Soil	Confirmation	Set 7
41003018			12 - 13.5	Soil	Confirmation	Set 7
41003019		Boring B03	8 - 9.5	Soil	Confirmation	Set 7
41003020			12 - 13.5	Soil	Confirmation	Set 7
41003021		Boring B04	8 - 9.5	Soil	Confirmation	Set 7
41003022			8 - 9.5	Soil	Field Duplicate of #4100321	Set 7
41003023			12 - 13.5	Soil	Confirmation	Set 7
41003024		Boring B05	12 - 13.5	Soil	Confirmation	Set 7
41003025	4/10/2003	Boring B06	7.5 - 9	Soil	Confirmation	Set 7
41003026		Boring B08	9.5 - 11	Soil	Confirmation	Set 7
41003027	4/29/2003	South Sidewall - Burn Pit	8 - 9	Soil	Confirmation	Set 7

Table A.7-1
Samples Collected for CAS 03-19-001, Waste Disposal Site
(Page 2 of 3)

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
41003028	4/30/2003	Floor - Burn Pit	10 - 12	Soil	Confirmation	Set 7
41003029			10 - 12	Soil	Confirmation	Set 7
41003030	5/2/2003	North Sidewall - TPH Pit	3 - 4	Soil	Confirmation	TPH-DRO
41003031		South Sidewall - TPH Pit	12 - 14	Soil	Confirmation	TPH-DRO
41003032	5/5/2003	North Sidewall - TPH Pit	16 - 17	Soil	Confirmation	TPH-DRO
41003033		West Sidewall - TPH Pit	6 - 8	Soil	Confirmation	TPH-DRO
41003034			15 - 16	Soil	Confirmation	TPH-DRO
41003035	5/6/2003	South Sidewall - TPH Pit	6 - 8	Soil	Confirmation	TPH-DRO
41003036			10 - 12	Soil	Confirmation	TPH-DRO
41003037		Floor - TPH Pit	16 - 17	Soil	Confirmation	TPH-DRO
41003038		South Sidewall - TPH Pit	3 - 4	Soil	Confirmation	TPH-DRO
41003039	5/2/2003	North Sidewall - TPH Pit	10 - 12	Soil	Confirmation	TPH-DRO
41003040		South Sidewall - TPH Pit	3 - 4	Soil	Background	TPH-DRO
41003041		North Sidewall - TPH Pit	2 - 3	Soil	Confirmation	TPH-DRO
41003042		Floor - TPH Pit	14 - 16	Soil	Confirmation	TPH-DRO
41003301	12/16/2002	NA	NA	Water	Trip Blank	Total VOCs
41003302	10/31/2002	NA	NA	Water	Field Blank	TPH-DRO
41003303	3/4/2003	NA	NA	Water	Trip Blank	Total VOCs
41003304	3/24/2003	NA	NA	Water	Trip Blank	Total VOCs
41003305	3/25/2003	NA	NA	Water	Trip Blank	Total VOCs
41003306	3/27/2003	NA	NA	Water	Trip Blank	Total VOCs
41003307		NA	NA	Water	Trip Blank	Total VOCs
41003308		NA	NA	Water	Source Blank	Set 5
41003309		NA	NA	Water	Equipment Rinsate Blank	Set 5
41003310		NA	NA	Water	WM	Set 5
41003311	4/9/2003	NA	NA	Water	Trip Blank	Total VOCs
41003312		NA	NA	Water	Trip Blank	Total VOCs

Table A.7-1
Samples Collected for CAS 03-19-001, Waste Disposal Site
(Page 3 of 3)

Sample Number	Sample Collection Date	Sample Location	Depth (ft bgs)	Sample Matrix	Purpose	Analyses
41003313	4/10/2003	NA	NA	Water	Trip Blank	Total VOCs
41003314		NA	NA	Water	Trip Blank	Total VOCs
41003315		NA	NA	Water	Source Blank	Set 5
41003316	4/15/2003	NA	NA	Water	Trip Blank	Total VOCs
41003317		NA	NA	Water	WM	Set 5
41003318	4/29/2003	NA	NA	Water	Trip Blank	Total VOCs
41003319	4/30/2003	NA	NA	Water	Trip Blank	Total VOCs
41003320	5/2/2003	NA	NA	Water	Trip Blank	Total VOCs
41003501	12/16/2002	NA	NA	Water	WM	Set 6
41003502		NA	NA	Water	Field Duplicate of #41003501	Set 6
41003503	1/8/2003	NA	NA	Water	WM	Isotopic Uranium
41003504	5/2/2003	NA	NA	Soil	WM	Set 8
410WM501	9/25/03	NA	NA	Water	Trip Blank	VOCs
410WM502		NA	NA	Liquid	WM	VOCs
410WM503		NA	NA	Liquid	WM	Flashpoint
410WM504		NA	NA	Liquid	WM	VOCs
410WM505		NA	NA	Liquid	WM	Flashpoint
410WM506		NA	NA	Liquid	WM	SVOCs

Set 4 = Total VOCs, Total SVOCs, Total RCRA Metals, HEs, TPH (DRO and GRO), Gamma Spectrometry, PCBs, Pesticides, and Herbicides

Set 5 = Total VOCs, Total SVOCs, Total RCRA Metals, Total Beryllium, HEs, TPH (DRO and GRO), Isotopic Uranium, Isotopic Plutonium, Gamma Spectrometry, PCBs, Pesticides, and Herbicides

Set 6 = Total VOCs, Total SVOCs, Total RCRA Metals, Total Beryllium, HEs, TPH (DRO and GRO), Isotopic Uranium, Isotopic Plutonium, and Gamma Spectrometry

Set 7 = Total VOCs, Total SVOCs, Total RCRA Metals, TPH (DRO and GRO), and Gamma Spectrometry

Set 8 = Total VOCs, Total SVOCs, Total RCRA Metals, TPH (DRO and GRO), and Gamma Spectrometry

TPH-DRO = Total Petroleum Hydrocarbons-Diesel-Range Organics

WM = Waste management

SC = Site characterization

NA = Not applicable

QC = Quality control

ft bgs = Feet below ground surface

A.7.2.1 Deviations

Because of changes in the scope of investigation activities, two ROTCs to the CAIP were implemented for this CAS. During the initial CAI activities in October 2002, undisturbed soil deposits were encountered in a trench excavation located approximately 15-ft south of the original SWS-4 sample location where FSRs exceeded FSLs for TPH-DRO during the CAU 405 investigation. Neither debris or stained soil were observed in the sides and/or bottom of the trench and none of the five samples collected indicated the presence of TPH.

Based on the October 2002 excavation and the historical investigation results, it was assumed that the TPH contamination was restricted to the immediate vicinity of the SWS-4 location at a depth of 4.5 to 5 ft bgs, in an area of approximately 30 cubic feet (ft³), with an approximate volume of 12 cubic yards (yd³). On this basis, ROTC No. 1 to the CAIP was submitted for supplemental field activities that included defining the site boundaries by excavation and delineating the vertical limits of potential TPH-DRO. It was anticipated that following the completion of limited excavation activities in the vicinity of SWS-4 that the remaining area of the CAS would be free of TPH-DRO greater than the PAL.

During the supplemental excavation activities on March 3 and 4, 2003, under ROTC No. 1, the investigation at 03-19-001 found significantly deeper (over 9 ft bgs) and larger volumes of stained soil and debris beyond the anticipated boundaries. Therefore, ROTC No. 3 to the CAIP was implemented for additional excavation activities to better define horizontal and vertical limits of the TPH-DRO contamination based on the most recent investigation results. An additional deviation from the CAIP was the use of hollow-stem auger drilling to aid in delineating TPH-DRO soil contamination without excavating large volumes of overburden.

A.7.3 Investigation Activities

The following sections provide CAS-specific details of excavation, drilling, field screening, and sample collection and analysis. The various phases of the supplemental excavation activities for CAS 03-19-001 are summarized in [Table A.7-2](#).

**Table A.7-2
Summary of Excavation Activities at CAS 03-19-001**

Date of Activities	Activity Summary
October 29, 2002	Samples 41003001 through 41003006 were collected from locations of elevated FSRs for TPH during the CAU 405 investigation.
March 3 and 4, 2003	Samples 41003006A through 41003008 were collected from stained soil and burned debris after being identified along the northern sidewall of the burn pit excavation activities.
March 24 to 27, 2003	Began pothole excavation in attempt to delineate boundaries of debris and staining. Samples 41003009 through 41003014 were collected from potholes #2 and #3 and the south, west, and northern sides of the original burn pit excavation.
April 7 to 10, 2003	Hollow-stem auger drilling used to further delineate TPH contamination on the southern end of the burn pit and attempt to define lateral limits of debris. Samples 41003015 through 41003026 were collected from soil borings B01 through B05, B06, and B08.
April 29 and 30, 2003	Completed excavation of the burn pit to define north, east, and south boundaries. Confirmation samples 41003027, 41003028, and 41003029 were collected from the south side wall and floor of the burn pit.
May 1 to 6, 2003	Started and completed excavation of the TPH area. Samples 41003030 through 41003042 were collected from the sidewalls and floor of the TPH excavation.

A.7.3.1 Field Screening

Soil samples were field screened for TPH-DRO and alpha and beta/gamma radiation. Established FSLs were used to guide sample collection, sample selection for laboratory analysis, and extent of excavation and drilling activities. Field-screening results for soil-screening samples collected from several subsurface locations within the CAS footprint exceeded the established TPH FSL of 75 ppm using Petroflag test kit. There were no FSRs that exceeded radiological FSLs.

Based on the FSRs and associated laboratory analytical results collected early in the investigation, it was determined that results of the Petroflag screening kit generally trended higher than the laboratory analytical results. While the FSL was not changed, several samples were submitted for laboratory analysis with FSRs above the FSL and excavation would be suspended in those locations pending laboratory results confirming TPH concentrations below action levels.

A.7.3.2 Excavation

During the October 2002 investigation, undisturbed soil deposits were encountered in an excavation located approximately 15 ft south of the original CAU 405 SWS-4 sample location. Five soil samples were collected from a backhoe bucket from subsurface locations based on previous field

screening locations from CAU 405. Both the depth of the trench and the sample interval was approximately 4.5 to 5 ft bgs. Visual observations of the soil brought to the surface and the sidewalls/floor of the trench indicated neither debris nor stained soil was present. Field screening and observations did not indicate the presence of TPH-DRO. [Figure A.7-1](#) shows the sample locations in relation to CAU 405 investigation locations.

Based on the October 2002 excavation and the historical investigation results, it was assumed that the TPH contamination was restricted to the immediate vicinity of the SWS-4 location to a depth of 4.5 to 5 ft bgs, in an area of approximately 30 square feet (ft²), with an approximate volume of 12 yd³. On this basis, ROTC No. 1 to the CAIP was submitted for supplemental field activities that included defining the site boundaries by excavation and delineating the vertical limits of potential TPH-DRO. These excavation activities were conducted on March 3 and 4, 2003.

The supplemental field activities commenced with an excavation starting at a central location within the boundaries established in ROTC No. 1 to the CAIP. Initial field screening for TPH indicated that overburden soil and subsurface soil had FSRs above the FSL. The soil was stockpiled as IDW. When the excavation reached a depth of 5 to 7 ft bgs, stained soil and burned debris was encountered (see [Figure A.7-2](#)). At that time three characterization samples were collected and submitted for analysis to define potential COCs. Those results indicated that no COCs were present. Because the depth (greater than 9 ft bgs) and width of debris and staining was greater than anticipated and beyond the capability of the equipment, excavation activities were suspended pending decisions on the investigation strategy. Excavation activities resumed March 24, 2003, after ROTC No. 3 to the CAIP was implemented, which documents the change to the CAS footprint. The investigation continued by trenching several potholes within the CAS footprint to determine lateral extent of the burn pit materials. While two potholes were able to identify the eastern boundary of the CAS, Pothole #2, which was located approximately 40 ft from the open excavation, encountered observable TPH contamination in the subsurface along with stained debris and soil. Analytical results confirmed TPH concentrations above PALS existed in the southern portion of the CAS approximately 40 to 50 ft south of the original CAU 405 SWS-4 location.

Figure A.7-1
Sample Location Map for Initial Investigation of CAS 03-19-001

Figure A.7-2
CAS 03-19-001 Stained Soil
(Stained soil and debris visible within excavation,
photo taken March 2003)

After drilling activities aided in defining vertical extent of the TPH contamination (see [Section A.7.3.3](#)), excavation resumed April 29, 2003, to further define the vertical and lateral boundaries of both the burn pit and TPH areas by collecting samples from the sidewalls and floor of the excavations. Based on the results of the borings, potholes, and FSRs, the northern boundary of TPH contamination within the burn pit was well defined thus becoming a focal point of separating the investigation into two distinct areas. As soil was removed from the subsurface to access sampling horizons, it was stockpiled separately based on visual and field-screening characteristics (i.e., hydrocarbon versus burned debris). Because initial analytical results indicated that soils and debris in the burn pit were not impacted by COPCs, excavation to delineate the boundaries resumed in the northern portion of the CAS ([Figure A.7-3](#)). Excavation into the TPH area commenced after confirming that the FSRs for sidewalls and floor of the burn pit area were below FSLs. Field screening for TPH was performed on various intervals along the sidewalls and floor of the TPH area to guide the excavation and select samples for laboratory analysis. Debris and staining was present in TPH soils at depths up to 12 to 13 ft bgs. Upon completion of defining the vertical and lateral

Figure A.7-3
CAS 03-19-001 Burn Pit
(View of completed burn pit excavation,
photo taken April 2003)

extent of TPH contamination (see [Figure A.7-4](#)), all contaminated soil above PALs (confirmed by analytical results) and debris had been removed and stockpiled as IDW. [Appendix D](#) shows additional photos of the completed excavation.

The overall dimensions of the burn pit were approximately 60 by 40 ft and up to 15 ft deep. The overall dimensions of the TPH area were approximately 20 by 40 by 17 ft deep. The vertical plane of the TPH southern boundary is located approximately 2 to 3 ft north of the CAU 424 use restriction. The final lateral limits of the excavation of the burn pit and TPH area are presented on [Figure A.7-5](#). [Figure A.7-6](#) is a more detailed sketch of the confirmation sample locations within the TPH excavation area.

A.7.3.3 Hollow-Stem Auger Drilling

Following the March 2003 excavation activities, hollow-stem auger (HSA) drilling was used to bound the extent of TPH-contaminated soils in the southern portion of the site and bound the extent

Figure A.7-4
CAS 03-19-001 TPH Area
(View of completed TPH excavation,
photo taken May 2003)

of potentially impacted soil for the remaining areas of the burn pit area. Decontaminated augers and drill pipe were used to drill to depths reaching up to 20 ft. Eighteen-inch split-spoon samplers were used to collect soil for sampling and boring descriptions. Observations were made of soil cuttings coming to the surface for debris and soil staining. A total of 10 borings were conducted at the site.

Soil boring B01 was drilled at the Pothole #2 location and soil borings B02 through B05 were installed as step-out borings to vertically and laterally bound the TPH-DRO-impacted material. In each boring, once the vertical extent of TPH-DRO contamination was determined by field screening and visual observations, confirmation samples were collected beneath the TPH-DRO-impacted material. In borings with no indication of contamination, a sample was collected from the depth interval associated with TPH contamination in Pothole #2 and Boring B01.

To guide additional excavation activities in the burn pit area, soil borings B06 through B10 were drilled to further delineate the lateral and vertical extent of the burn pit. Soil samples were collected

Figure A.7-5
General Site Layout and Sample Location Map after
Supplemental Field Activities, CAS 03-19-001

Figure A.7-6
Detailed Sketch of TPH Confirmation Sample Locations, CAS 03-19-001

and submitted for laboratory analysis from borings B06 and B08 to confirm that TPH-DRO or other COPCs were not present at these locations. The subsurface geology was logged for each of the borings.

A.7.3.4 Waste Characterization

Stained soil and burned debris as well as TPH-contaminated waste (i.e., soil and debris) were separated and segregated into stockpiles as IDW during excavation activities. Any clean overburden soil as indicated by visual observations and field screening was also separated for use as backfill. A limited number of waste characterization samples were submitted for laboratory analyses. No verification samples of the ground surface was necessary as the TPH soil was stockpiled on plastic. The burn pit waste stockpile was shown to be nonhazardous and non-TPH contaminated so verification samples were not necessary. Details regarding the waste management and closure-type activities are provided in [Appendix D](#).

A.7.3.5 Sample Analysis

The analytical results were compared to PALs for the TPH-DRO parameters during the initial October 2002 investigation. The analytical results for samples collected during the supplemental field activities conducted in March and April 2003 were compared to PALs for various combinations of the parameters including total VOCs, total SVOCs, total RCRA metals, HEs, total beryllium, gamma spectrometry, TPH-DRO and -GRO, PCBs, pesticides, herbicides, isotopic uranium, and isotopic plutonium.

A.7.4 Analytes Detected Above MRL

The analytical results detected at concentrations exceeding the correlated MRLs at this CAS are summarized in the following sections.

A.7.4.1 Total SVOCs

The total SVOC results for soil samples collected from CAS 03-19-001, which were detected above MRLs, are presented on [Table A.7-3](#). Phenanthrene, the only analyte detected, does not have a

defined PAL (NNSA/NV, 2002a). The soil associated with this sample was removed from the subsurface during characterization activities.

Table A.7-3
Soil Sample Results for Total SVOCs
Detected Above Minimum Reporting Limits at CAS 03-19-001

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (µg/kg)
			Phenanthrene
Preliminary Action Levels ^a			NI
41003009	NA	NA	710

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

ft bgs = Feet below ground surface

µg/kg = Micrograms per kilogram

NA = Not applicable

NI = Not identified

A.7.4.2 Total Metals

The total metals results for soil samples collected from CAS 03-19-001, which were detected above MRLs, are presented on [Table A.7-4](#). All total metals results are below PALs (NNSA/NV, 2002a).

A.7.4.3 TPH-DRO

The TPH-DRO results for soil samples collected from CAS 03-19-001, which were detected above MRLs, are presented on [Table A.7-5](#). The TPH-DRO was detected above the PAL in soil samples 41003009 and 41003015. These soil samples were collected to characterize soils during initial excavation and represent soils that were removed during soil excavation activities.

A.7.4.4 PCBs

The PCB results for soil samples collected from CAS 03-19-001, which were detected above MRLs, are presented on [Table A.7-6](#). All PCB results are below PALs (NNSA/NV, 2002a).

Table A.7-4
Soil Sample Results for Metals Detected
Above Minimum Reporting Limits at CAS 03-19-001
(Page 1 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (mg/kg)							
			Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Silver
Preliminary Action Levels ^a			23 ^b	100,000	2,200	810	450	750	610	10,000
41003006A	North Sidewall - Burn Pit	4.5 - 5	8	510	--	5.2	14	170	2.8	220
41003007		4.5 - 5	4.5	120	--	1.2	8.6	110	0.51	27
41003008		4.5 - 5	4.4	100	--	1.2	5.6	370	0.53	26
41003009	Pothole #2	7	4.2	94	0.59	5.1	12 (J)	9	--	7.6
41003010		0 - 1	4.2	10	0.57	--	4.5 (J)	8.6	--	--
41003011	Pothole #3	7	4	80	--	--	2.8	7.4	--	--
41003012	South Sidewall - Burn Pit	4 - 5	4.6	110	0.58	--	4.9	8.5	--	--
41003013	West Sidewall - Burn Pit	6 - 7	5.4	130	0.72	--	6.5	9	--	--
41003014	North Sidewall - Burn Pit	8 - 9	4.7	110	0.56	--	4.2	7.7	--	--
41003015	Boring B01	12 - 13.5	4.6	140	--	--	5.4	7.9	--	--
41003016		17 - 18.5	5.5	160	--	--	4.1	8.9	--	--
41003017	Boring B02	8 - 9.5	4	92	--	--	3.8	7.8	--	--
41003018		12 - 13.5	5.4	170	--	--	6.3	11	--	--
41003019	Boring B03	8 - 9.5	4.7	110	--	--	7.1	8.5	--	--
41003020		12 - 13.5	4.5	120	--	--	4.4	7.8	--	--
41003021	Boring B04	8 - 9.5	4.6	120	--	--	6.6	8.4	--	--
41003022		8 - 9.5	4.5	110	--	--	8.6	8.1	--	--
41003023		12 - 13.5	5.1	190	--	--	7.3	8.8	--	--

Table A.7-4
Soil Sample Results for Metals Detected
Above Minimum Reporting Limits at CAS 03-19-001
(Page 2 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (mg/kg)							
			Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Silver
Preliminary Action Levels ^a			23 ^b	100,000	2,200	810	450	750	610	10,000
41003024	Boring B05	12 - 13.5	5.2	240	--	--	6.8	11	--	--
41003025	Boring B06	7.5 - 9	3.9	130	--	--	3.8	7.3	--	--
41003026	Boring B08	9.5 - 11	5.3	81	--	--	10	6.5	--	--
41003027	South Sidewall - Burn Pit	8 - 9	4.5	100	--	--	5	8.5	--	--
41003028	Floor - Burn Pit	10 - 12	3.7	150	--	--	3.5	12	--	--
41003029		10 - 12	4	90	--	--	2.8	6.9	--	--

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

^bBased on background concentrations for metals. Background is considered the mean plus two standard deviation for sediment samples collected by the Nevada Bureau of Mines and Geology throughout the Nevada Test and Training Range (NBMG, 1998; Moore, 1999).

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

-- = Not detected above minimum reporting limits

J = Estimated value. Qualifier added to laboratory data; record accepted. Serial dilution %D outside control limits. Matrix effects may exist.

NA = Not applicable

Table A.7-5
Soil Sample Results for TPH-DRO
Detected Above Minimum Reporting Limits at CAS 03-19-001

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (mg/kg)
			Diesel-Range Organics
Preliminary Action Levels ^a			100
41003007	North Sidewall - Burn Pit	4.5 - 5	31 (J) ^b
41003008		4.5 - 5	44 (J) ^b
41003009	Pothole #2	7	1,100 (D)
41003015	Boring B01	12 - 13.5	630 (D)
41003029	Floor - Burn Pit	10 - 12	27 (J) ^b
41003031	South Sidewall - TPH Pit	12 - 14	43 (J) ^b
41003032	North Sidewall - TPH Pit	16 - 17	28 (J) ^b
41003040	South Sidewall - TPH Pit	3 - 4	62 (J) ^c
41003042	Floor - TPH Pit	14 - 16	54 (J) ^c

^aBased on *Nevada Administrative Code*; Contamination of soil: Establishment of Action Levels (NAC, 2002)

^bQualifier added to laboratory data; record accepted. Total extractable petroleum hydrocarbons result quantitated from diesel standard calibration.

^cQualifier added to laboratory data; record accepted. Total extractable petroleum hydrocarbons result quantitated from diesel standard calibration. Improper packaging of sample container/custody tape not used.

ft bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

D = Dilution run. Initial run outside linear range of instrument.

J = Estimated value

Table A.7-6
Soil Sample Results for PCBs Detected
Above Minimum Reporting Limits at CAS 03-19-001

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (µg/kg)
			Aroclor-1260
Preliminary Action Levels ^a			1,000
41003006RR1	North Sidewall - Burn Pit	4.5 - 5	300
41003007		4.5 - 5	89
41003008		4.5 - 5	86

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

ft bgs = Feet below ground surface

µg/kg = Micrograms per kilogram

A.7.4.5 Pesticides

The pesticide results for soil samples collected from CAS 03-19-001, which were detected above MRLs, are presented on [Table A.7-7](#). All pesticide results are below PALs (NNSA/NV, 2002a).

Table A.7-7
Soil Sample Results for Pesticides
Detected Above Minimum Reporting Limits at CAS 03-19-001

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (µg/kg)	
			Dieldrin	Gamma-BHC (Lindane)
Preliminary Action Levels ^a			150	2,900
41003009	Pothole #2	7	1.9 (J)	7.1 (J)

^aBased on U.S. Environmental Protection Agency, *Region 9 Preliminary Remediation Goals (PRGs)* (EPA, 2000b)

ft bgs = Feet below ground surface

µg/kg = Micrograms per kilogram

J = Estimated value. Qualifier added to laboratory data; record accepted. Surrogate recovery exceeded the upper limits.

A.7.4.6 Isotopic Uranium

The isotopic uranium results for soil samples collected from CAS 03-19-001, which were detected above MRLs, are presented on [Table A.7-8](#). All isotopic uranium results are below PALs (NNSA/NV, 2002a).

A.7.4.7 Gamma-Emitting Radionuclides

The gamma-emitting radionuclide results for soil samples collected from CAS 03-19-001, which were detected above MRLs, are presented on [Table A.7-9](#). Except for potassium-40, all gamma-emitting radionuclide results are below PALs (NNSA/NV, 2002a). Potassium-40 was detected at concentrations exceeding the PALs; however, potassium-40 analytical results were evaluated using the normalized difference test as discussed in [Section A.2.7](#). The potassium-40 concentrations are considered indistinguishable from the PAL.

**Table A.7-8
Soil Sample Results for Isotopic Uranium
Detected Above Minimum Reporting Limits at CAS 03-19-001**

Sample Number	Sample Locations	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)		
			Uranium-234	Uranium-235	Uranium-238
Preliminary Action Levels ^a			3.47	0.07	3.47
41003009	Pothole #2	7	1.15 ± 0.21	0.071 ± 0.036	0.99 ± 0.18
41003010		0 - 1	1.21 ± 0.21	0.071 ± 0.035	1.12 ± 0.20
41003011	Pothole #3	7	1.04 ± 0.18	0.073 ± 0.034	1.07 ± 0.18
41003012	South Sidewall - Burn Pit	4 - 5	1.31 ± 0.21	--	1.28 ± 0.21
41003013	West Sidewall - Burn Pit	6 - 7	1.33 ± 0.21	0.098 ± 0.040	1.16 ± 0.19
41003014	North Sidewall - Burn Pit	8 - 9	1.1 ± 0.18	0.071 ± 0.035	1.3 ± 0.21

^aBased on background concentration listed in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

^bBased on background concentration listed or derived in *Off-Site Radiation Exposure Review Project, Phase II Soil Program* (McArthur and Miller, 1989)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

-- = Not detected above minimum reporting limits

A.7.5 Contaminants of Concern

The only COC identified in subsurface soil of CAS 03-19-001 was TPH-DRO found in the southern end of the CAS footprint referred to as the TPH area. Based on the analytical results of the final confirmation samples, there are no COCs identified in the remaining soil.

A.7.6 Nature and Extent of Contamination

The nature and extent of TPH contamination was delineated through sample collection by excavation and drilling activities. The vertical and lateral extent of debris and stained soil associated with both the burn pit and TPH areas was delineated through visual observations while excavating to access sample horizons. Due to the nature of the investigation in which TPH-contaminated soil and soil mixed with debris was stockpiled and disposed as IDW, there is no remaining TPH contamination or debris at this CAS. This is confirmed by visual observations and confirmation sample results.

Table A.7-9
Soil Sample Results for Gamma-Emitting Radionuclides
Detected Above Minimum Reporting Limits at CAS 03-19-001
(Page 1 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)					
			Actinium-228	Bismuth-214	Lead-212	Lead-214	Potassium-40	Thallium-208
Preliminary Action Levels			3.64 ^a	3.47 ^a	3.64 ^a	3.47 ^a	30.7 ^b	3.38 ^a
41003006A	North Sidewall - Burn Pit	4.5 - 5	1.68 ± 0.51	1.18 ± 0.38	1.51 ± 0.36	1.29 ± 0.33	28.5 ± 6.2	0.66 ± 0.21
41003007		4.5 - 5	1.92 ± 0.71	0.97 ± 0.40	1.55 ± 0.39	0.97 ± 0.30	26 ± 6.3	0.59 ± 0.22
41003008		4.5 - 5	1.5 ± 0.45	0.87 ± 0.31	1.82 ± 0.36	1.18 ± 0.30	32.8 ± 6.3	0.42 ± 0.14
41003009	Pothole #2	7	1.44 ± 0.42	1.13 ± 0.31	1.66 ± 0.35	1.41 ± 0.30	27.7 ± 5.4	0.56 ± 0.15
41003010		0 - 1	1.77 ± 0.49	1.07 ± 0.32	2.27 ± 0.45	1.24 ± 0.29	25.6 ± 5.4	0.66 ± 0.18
41003011	Pothole #3	7	1.61 ± 0.38	0.94 ± 0.24	1.98 ± 0.38	1.05 ± 0.24	27.1 ± 5.1	0.65 ± 0.16
41003012	South Sidewall - Burn Pit	4 - 5	1.78 ± 0.41	1.12 ± 0.27	1.73 ± 0.34	1.35 ± 0.28	30.1 ± 5.6	0.64 ± 0.16
41003013	West Sidewall - Burn Pit	6 - 7	1.64 ± 0.43	1.42 ± 0.36	1.92 ± 0.39	1.38 ± 0.31	26.8 ± 5.3	0.68 ± 0.18
41003014	North Sidewall - Burn Pit	8 - 9	1.63 ± 0.39	1.11 ± 0.28	1.88 ± 0.37	1.22 ± 0.27	27 ± 5.2	0.42 ± 0.12
41003015	Boring B01	12 - 13.5	1.68 ± 0.48	1.11 ± 0.37	2.08 ± 0.42	1.48 ± 0.34	33.3 ± 6.4	0.57 ± 0.17
41003016		17 - 18.5	2.21 ± 0.76	--	1.62 ± 0.41	1.09 ± 0.35	30.5 ± 7.0	0.73 ± 0.25
41003017	Boring B02	8 - 9.5	1.23 ± 0.40	0.89 ± 0.33	1.61 ± 0.33	0.67 ± 0.22	25 ± 5.0	0.37 ± 0.13
41003018		12 - 13.5	--	--	2.32 ± 0.51	1.42 ± 0.41	34.2 ± 7.8	0.63 ± 0.25
41003019	Boring B03	8 - 9.5	--	--	2.12 ± 0.48	1.28 ± 0.36	27.6 ± 6.8	--
41003020		12 - 13.5	1.89 ± 0.52	1.1 ± 0.37	1.73 ± 0.36	1.17 ± 0.30	32.6 ± 6.3	0.58 ± 0.17
41003021	Boring B04	8 - 9.5	--	1.34 ± 0.50	2.26 ± 0.51	0.91 ± 0.32	27.9 ± 7.3	--
41003022		8 - 9.5	--	1.19 ± 0.45	1.8 ± 0.45	0.84 ± 0.31	29.2 ± 6.8	--
41003023		12 - 13.5	1.98 ± 0.55	1.09 ± 0.39	2 ± 0.41	1.2 ± 0.31	33.6 ± 6.6	0.5 ± 0.16

Table A.7-9
Soil Sample Results for Gamma-Emitting Radionuclides
Detected Above Minimum Reporting Limits at CAS 03-19-001
(Page 2 of 2)

Sample Number	Sample Location	Depth (ft bgs)	Contaminants of Potential Concern (pCi/g)					
			Actinium-228	Bismuth-214	Lead-212	Lead-214	Potassium-40	Thallium-208
Preliminary Action Levels			3.64 ^a	3.47 ^a	3.64 ^a	3.47 ^a	30.7 ^b	3.38 ^a
41003024	Boring B05	12 - 13.5	1.63 ± 0.61	0.98 ± 0.40	1.79 ± 0.45	1.22 ± 0.35	29.1 ± 6.7	0.49 ± 0.19
41003025	Boring B06	7.5 - 9	1.76 ± 0.58	1.03 ± 0.40	1.99 ± 0.46	1.47 ± 0.39	35.3 ± 7.7	0.58 ± 0.21
41003026	Boring B08	9.5 - 11	--	1.31 ± 0.45	1.86 ± 0.45	1.38 ± 0.38	32.5 ± 7.4	0.42 ± 0.18
41003027	South Sidewall - Burn Pit	8 - 9	1.59 ± 0.58	1.05 ± 0.41	1.55 ± 0.38	1.17 ± 0.33	26.6 ± 6.1	0.62 ± 0.22
41003028	Floor - Burn Pit	10 - 12	1.19 ± 0.45	1.41 ± 0.42	1.65 ± 0.38	1.1 ± 0.30	29.6 ± 6.3	0.58 ± 0.19
41003029		10 - 12	1.85 ± 0.60	0.93 ± 0.37	1.4 ± 0.37	1.03 ± 0.31	31 ± 7.0	0.63 ± 0.21

^aBased on background concentration reported in *Environmental Monitoring Report for the Proposed Ward Valley, California, Low-Level Radioactive Waste (LLRW) Facility* (US Ecology and Atlan-Tech, 1991)

^bBased on background concentration listed or derived in *Off-Site Radiation Exposure Review Project, Phase II Soil Program* (McArthur and Miller, 1989)

ft bgs = Feet below ground surface

pCi/g = Picocuries per gram

-- = Not detected above minimum reporting limits

NA = Not applicable

A.7.7 Revised Conceptual Site Model

The configuration and scope of CAS 03-19-001 was inconsistent with the historical information; however, there were no variations to the CSM with regards to the target population, source area, contaminant migration, or exposure pathways.

A.8.0 Quality Assurance

This section contains a summary of the QA/QC measures implemented during the sampling, analysis, and investigation activities for CAU 410 corrective action investigation. The following sections of this appendix discuss the data validation process and the quality control samples.

[Appendix B](#) provides a detailed evaluation of the DQIs of precision, accuracy, completeness, representativeness, and comparability for analytical results.

Laboratory analyses were conducted for samples used in the decision-making process to provide a quantitative measurement of any COPCs present. The QA/QC was implemented for all laboratory samples including documentation, data verification and validation of analytical results, and affirmation of DQI requirements related to laboratory analysis. Detailed information regarding the QA program is contained in the Industrial Sites QAPP (NNSA/NV, 2002b).

A.8.1 Data Validation

Data validation was performed in accordance with the Industrial Sites QAPP (NNSA/NV, 2002b) and approved procedures. All laboratory data from samples collected and analyzed for CAU 410 were evaluated for data quality according to the U.S. Environmental Protection Agency (EPA) Functional Guidelines (EPA, 1994a and 2000a). These guidelines are implemented in a tiered process and are presented in [Section A.8.1.1](#) through [Section A.8.1.3](#). Data were reviewed to ensure that samples were appropriately processed and analyzed, and the results passed data-validation criteria. Documentation of the data qualifications resulting from these reviews is retained in project files as a hard copy and electronic media.

One hundred percent of the data analyzed as part of this investigation were subjected to Tier I and Tier II evaluations. A Tier III evaluation was performed on 11 samples.

A.8.1.1 Tier I Evaluation

Tier I evaluation for both chemical and radiological analysis examines (but is not limited to):

- Sample count/type consistent with chain of custody
- Analysis count/type consistent with chain of custody

- Correct sample matrix
- Significant problems stated in cover letter or case narrative
- Completeness of certificates of analysis
- Completeness of contract laboratory program (CLP) or CLP-like packages
- Completeness of signatures, dates, and times on chain of custody
- Condition-upon-receipt variance form included
- Requested analyses performed on all samples
- Date received/analyzed given for each sample
- Correct concentration units indicated
- Electronic data transfer supplied
- Results reported for field and laboratory QC samples
- Whether or not the deliverable met the overall objectives of the project
- Proper field documentation accompanies project packages

A.8.1.2 Tier II Evaluation

Tier II evaluation for both chemical and radiological analysis examines, but is not limited to, the following areas.

Chemical:

- Correct detection limits achieved
- Sample date, preparation date, and analysis date for each sample
- Holding time criteria met
- QC batch association for each sample
- Cooler temperature upon receipt
- Sample pH for aqueous samples, as required
- Detection limits properly adjusted for dilution, as required
- Blank contamination evaluated and applied to sample results/qualifiers
- Matrix spike/matrix spike duplicate (MS/MSD) percent recovery (%R) and relative percent difference (RPDs) evaluated and applied to laboratory results/qualifiers
- Field duplicate RPDs evaluated using professional judgement and applied to laboratory results/qualifiers
- Laboratory duplicate RPDs evaluated and applied to laboratory results/qualifiers
- Surrogate %Rs evaluated and applied to laboratory results/qualifiers
- Laboratory control sample %R evaluated and applied to laboratory results/qualifiers

- Initial and continuing calibration evaluated and applied to laboratory results/qualifiers
- Internal standard evaluated and applied to laboratory results/qualifiers
- Mass spectrometer tuning criteria
- Organic compound quantitation
- Inductively coupled plasma (ICP) interference check sample evaluation
- Graphite furnace atomic absorption quality control
- ICP serial dilution effects
- Recalculation of 10 percent of laboratory results from raw data

Radioanalytical:

- Correct detection limits achieved
- Blank contamination evaluated and applied to sample results/qualifiers
- Certificate of Analysis consistent with data package documentation
- Quality control sample results (duplicates, laboratory control samples, laboratory blanks) evaluated and applied to laboratory result qualifiers
- Sample results, error, and minimum detectable activity evaluated and applied to laboratory result qualifiers
- Detector system calibrated to National Institute for Standards and Technology (NIST)-traceable sources
- Calibration sources preparation was documented, demonstrating proper preparation and appropriateness for sample matrix, emission energies, and concentrations
- Detector system response to daily, weekly, and monthly background and calibration checks, which may include peak energy, peak centroid, peak full-width half-maximum, and peak efficiency, depending on the detection system
- Tracers NIST-traceable, appropriate for the analysis performed, and recoveries that met QC requirements
- Documentation of all QC sample preparation complete and properly performed
- QC sample results (e.g., calibration source concentration, percent recovery, and RPD) verified
- Spectra lines, emissions, particle energies, peak areas, and background peak areas support the identified radionuclide and its concentration
- Recalculation of 10 percent of laboratory results from raw data

A.8.1.3 Tier III Evaluation

A Tier III evaluation looks at all the items evaluated in the Tier II evaluation, but for only a limited number of samples (typically 5 percent). It serves as a check on the Tier II process. The Tier III review includes the additional evaluations:

Chemical:

- Recalculation of laboratory results from raw data

Radioanalytical:

- Radionuclides and their concentration appropriate considering their decay schemes and half-lives
- Each identified line in spectra verified against emission libraries and calibration results
- Independent identification of spectra lines, area under the peaks, and quantification of radionuclide concentration in a random number of sample results
- Recalculation of laboratory results from raw data

A Tier III review of 11 samples was conducted by TechLaw, Inc. in Lakewood, Colorado. The qualifiers for the samples analyzed for radiochemical analysis did not change based on the Tier III review. The qualifier for chemical analysis regarding one sample (410AL517) was changed for lead based on the review, lead results should have been estimated at the Tier II level. This review has been reflected for that sample delivery group (SDG). Additionally, the 19 other samples within the SDG were also changed to reflect the estimated value based on the Tier III review.

A.8.2 Quality Control Samples

There were 30 trip blanks, 7 field blanks, 3 source blanks, 3 equipment rinsate blanks, 5 MS/MSD, and 11 field duplicates collected and submitted for laboratory analysis as shown in CAS-specific [Tables A.3-1, A.4-1, A.5-1, A.6-1, and A.7-1](#). The quality control samples and duplicates were assigned individual sample numbers and sent to the laboratory “blind.” Additional samples were selected by the laboratory to be analyzed as laboratory duplicates. Documentation related to the collection and analysis of these samples is retained in project files.

A.8.2.1 Field Quality Control Samples

Review of the field-blank analytical data for the CAU 410 soil sampling indicates that cross contamination from field methods did not occur during sample collection. Field, equipment rinsate, and source blanks were analyzed for the parameters specific to each CAS that are given in the tables referenced above. Trip blanks were analyzed for VOCs only. Several different analytes were detected in some of the samples but they were below or slightly above the contract-required detection limit (CRDLs).

During the sampling events, 11 field duplicate soil samples were sent as blind samples to the laboratory to be analyzed for the investigation parameters listed in each CAS-specific table. For these samples, the duplicate results precision (i.e., RPDs between the environmental sample results and their corresponding field duplicate sample results) were evaluated to the guidelines set forth in EPA Functional Guidelines (EPA, 1994a and 2000a).

A.8.2.2 Laboratory Quality Control Samples

Analysis of method QC blanks were performed on each SDG for inorganics. Analysis for surrogate spikes and preparation blanks (PBs) were performed on each SDG for organics only. Initial and continuing calibration and laboratory control samples (LCS) were performed for each SDG. The results of these analyses were used to qualify associated environmental sample results according to EPA Functional Guidelines (EPA, 1994a and 2000a). Documentation of data qualifications resulting from the application of these guidelines is retained in project files as both hard copy and electronic media.

A.8.3 Field Nonconformances

One field nonconformance was identified regarding trip blanks not sent to the laboratory with the associated samples. It was determined that the water sample 41003317 did not have an associated trip blank because a temperature blank (41003316) was sent in place of a trip blank and the analysis was cancelled. The samples were analyzed without the required associated trip blank and the VOC results were estimated. The estimated VOC results did not impact sample acceptability.

Documentation of the nonconformance is retained in the project files.

A.8.4 *Laboratory Nonconformances*

Laboratory nonconformances are generally due to inconsistencies in analytical instrumentation operation, sample preparation, extractions, and fluctuations in internal standard and calibration results. A total of 13 laboratory nonconformances were identified. One laboratory nonconformance was identified regarding five samples analyzed for GRO outside of the 14-day holding time criteria resulting in the estimation (J) of GRO for samples 410AL009, 410AL010, 410AL011, 410AL012, and 410AL013. The nonconformance was a result of the laboratory receiving samples with only 3 to 4 days of holding time remaining due to adverse weather conditions at the laboratory. The nonconformances have been accounted for in the data qualification process. Documentation of the nonconformances are retained in project files.

A.9.0 Summary

Analytes detected in soil samples during the CAI were evaluated against PALs to determine the nature and extent of COCs for CAU 410. Assessment of the data generated from investigation activities indicated the PALs were exceeded in soil samples at three CASs for TPH or DU.

However, based on the nature of supplemental field activities implemented to define the nature and extent of debris and COCs in these three CASs, soil that exceeded PALs was removed and disposed as IDW. Data generated from corrective action investigation activities at CAU 410 indicates the following:

CASs 09-21-001-TA09 and TA-21-003-TANL. Initial investigation sample results indicate there were no COCs above regulatory levels at CASs 09-21-001-TA09 and TA-21-003-TANL. Subsequently there were no supplemental field activities performed at these two CASs.

CAS TA-19-002-TAB2. Upon completion of the supplemental field activities that included characterizing vertical and lateral extent of potential contamination and performing waste management, there remains no debris or COCs above regulatory levels in the subsurface and surface soils.

CAS TA-21-002-TAAL. Upon completion of the supplemental field activities that included characterizing vertical and lateral extent of potential contamination and performing waste management, there remains no debris or COCs above regulatory levels in the subsurface and surface soils.

CAS 03-19-001. Upon completion of the supplemental field activities that included characterizing vertical and lateral extent of potential contamination and performing waste management, there remains no debris or COCs above regulatory levels in the subsurface soils.

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Appendix B

Data Assessment for CAU 410

B.1.0 Data Assessment

This appendix provides a summary of the assessment of CAU 410 data validation results for each DQI. In addition, a reconciliation of the data with generalized CSMs established for this project is provided.

B.1.1 Statement of Acceptability and Usability

This section provides an evaluation of the DQIs in determining the degree of acceptability and usability of the reported data in the decision-making process.

Data were evaluated against specific criteria to verify the achievement of DQI goals established to meet the project DQOs as provided in the Industrial Sites QAPP (NNSA/NV, 2002b) and the CAU 410 CAIP (NNSA/NV, 2002a). The DQIs for this project include precision, accuracy, completeness, representativeness, and comparability.

B.1.1.1 Precision

Precision is a measure of agreement among a replicate set of measurements of the same property under similar conditions. This agreement is expressed as the relative percent difference (RPD) between duplicate measurements (EPA, 1996). The RPD is determined by dividing the difference between the replicate measurement values by the average measurement value and multiplying the result by 100, or:

$$RPD = *100 \times [(a_1 - a_2)/(a_1 + a_2)/ 2)]^*,$$

where

- a_1 = The sample value, and
- a_2 = The duplicate sample value.

Determinations of precision can be made for field samples, laboratory duplicates, or both. For field samples, duplicates are collected simultaneously with a sample from the same source under similar conditions in separate containers. The duplicate sample is treated independently of the original sample in order to assess field impacts and laboratory performance on precision through a

comparison of results. Laboratory precision is evaluated as part of the required laboratory internal QC program to assess performance of analytical procedures. The laboratory sample duplicates are an aliquot or subset of a field sample generated in the laboratory. They are not a separate sample but portions of an existing sample. Typically, other laboratory duplicate QC samples include MSD and laboratory control sample duplicate (LCSD) samples.

The variability in the results from the analysis of field duplicates is generally greater than the variability in the results of laboratory duplicates. This higher variability for field duplicates results from the increased potential to introduce factors influencing the analytical results during sampling, sample preparation, containerization, handling, packaging, preservation, and environmental conditions before the samples reach the laboratory. Laboratory QC samples assess only the variability of results introduced by sample handling and preparation in the laboratory and by the analytical procedure, which also impacts field duplicates. In addition, the variability in duplicate results is expected to be greater for soil samples than water samples, primarily due to the inherent nonhomogeneous nature of soil samples, despite sample preparation methods that include mixing to improve sample homogeneity.

B.1.1.1.1 Precision for Chemical Analyses

The RPD criteria used for assessment of laboratory sample duplicate precision for analytical results of samples collected at CAU 410 were established as follows:

- Inorganic analysis RPD criteria is obtained from the EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 1994).
- Organic analysis RPD criteria is established by the laboratory to evaluate precision for MSD and LCSD analyses.
- The control limits are evaluated at the laboratory on a quarterly basis by monitoring the historical data and performance for each method.
- No review criteria for organic field duplicate RPD comparability have been established; therefore, the laboratory MSD RPD criteria is applied for precision evaluation of field duplicates.

Precision values for organic and inorganic analysis that are within the established control criteria indicate that analytical results for associated samples are valid. Laboratory duplicate RPD values that

are outside the criteria for organic analysis do not necessarily result in the qualification of analytical data. It is only one factor in making an overall judgment about the quality of the reported analytical results. Inorganic laboratory duplicate RPD values outside the established control criteria do result in the qualification of associated analytical results as estimated. Field duplicate RPD values that are outside the criteria for organic and inorganic analyses do not result in the qualification of analytical data. Out of control RPD values do not necessarily indicate that the data are not useful for the purpose intended; however, it is an indication data precision should be considered for the overall assessment of the data quality and potential impact on data application in meeting project site characterization objectives. Method-specific precision as RPD is determined by taking the number of measurements within criteria, dividing that by the number of measurements analyzed, and multiplying by 100.

For the purpose of determining data precision of sample analyses for CAU 410, all water and soil samples, including field QC samples (i.e., trip blanks, equipment rinsate samples, field blanks) were evaluated and incorporated into the precision calculation.

Precision for the measurement of target compounds or analytes collected at CAU 410 was determined for RCRA metals and beryllium, VOCs, SVOCs, TPH-DRO and TPH-GRO, explosives, pesticides, PCBs, and herbicides.

[Table B.1-1](#) provides the field and laboratory duplicate precision analysis results.

Inorganic laboratory duplicate RPD values outside the established control criteria result in estimation for that measurement of all associated samples in the SDG. For example, if a laboratory duplicate had an RPD value for lead outside the established control criteria, lead results for all of the samples in that SDG would be qualified as estimated.

Out of control RPD values do not necessarily indicate that the data is not useful for the purpose intended. It does indicate that precision should be considered for the overall assessment of the data quality and impact to the application of associated data to meeting project's objectives.

Table B.1-1
Chemical Precision Measurements for CAU 410
(Page 1 of 2)

[illegible]

Table B.1-1
Chemical Precision Measurements for CAU 410
(Page 2 of 2)

	ORGANICS								INORGANICS	
	VOCs	SVOCs	TPH-DRO	TPH-GRO	Explosive	Pesticides	PCBs	Herbicides	Metals	Mercury
Laboratory Sample Duplicate (Lab-Dup) Precision										
Total Number of RPDs within Criteria	NA	NA	NA	NA	NA	NA	NA	NA	78	10
Lab-Dup % Precision	NA	NA	NA	NA	NA	NA	NA	NA	100	100

Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Selenium, Silver

B.1.1.1.2 Precision for Radiological Analysis

The precision of radiochemical measurements is evaluated by measuring two aliquots of a sample and comparing the results. A laboratory duplicate is measured with every batch of samples analyzed by the laboratory. Field duplicate data is available when two aliquots of a sample are submitted to the laboratory for analysis. Laboratory control sample duplicates are measured by the laboratory when there is insufficient sample to measure a duplicate of a field sample. Matrix spike duplicates, also used to evaluate precision, are performed by the laboratory upon request.

The duplicate precision is evaluated using the RPD or normalized difference. The RPD is applicable when both the sample and its duplicate have concentrations of the target radionuclide exceeding five times their minimum detectable concentration. This excludes many measurements because the samples contain nondetectable or low levels of the target radionuclide. In situations where the RPD does not apply, duplicate results are evaluated using the normalized difference which is expressed by:

$$\text{Normalized Difference} = \frac{S - D}{\sqrt{(\text{TPU}_S)^2 + (\text{TPU}_D)^2}}$$

Where:

- S = Sample result
- D = Duplicate Result
- TPU_S = 2σ TPU of the sample
- TPU_D = 2σ TPU of the duplicate
- σ = Standard deviation

The control limit for the normalized difference is -1.96 to 1.96, which represent a confidence level of 95 percent. Depending on the sample concentration, only one duplicate evaluation needs to be performed.

Samples are qualified based on laboratory prepared duplicates, but not field duplicates or MSDs.

A duplicate comparison that is outside control limits does not necessarily indicate that the data is not useful for the purpose intended; however, it is an indication that data precision should be considered for the overall assessment of the data quality and potential impact on data application in meeting project site characterization objectives.

For the purpose of determining data precision of sample analyses for CAU 410, all water and soil duplicates were evaluated and incorporated into [Table B.1-2](#) and [Table B.1-3](#).

Table B.1-2
Laboratory Duplicate Precision for Radioanalytes

	Gamma Spectroscopy	Isotopic Uranium	Isotopic Plutonium
Relative Percent Different			
Number Performed	41	50	2
Number Within Limits	41	48	2
Percent Within Limits	100	96	100
Normalized Difference			
Number Performed	404	25	32
Number Within Limits	401	25	32
Percent Within Limits	99	100	100

Table B.1-3
Laboratory Matrix Spike/Matrix Spike Duplicate Precision for Radioanalytes

	Isotopic Uranium	Isotopic Plutonium
Relative Percent Different		
Number Performed	2	1
Number Within Limits	2	1
Percent Within Limits	100	100

The isotopic gamma analysis provides results for 22-24 radionuclides. Only two or three of these radionuclides are usually present in sufficient concentrations to allow the determination of their RPDs. The duplicate data for the remaining radionuclides is compared using the normalized difference. The isotopic uranium analysis provides results for three uranium isotopes while the isotopic plutonium (Pu) analysis gives results for Pu-238 and Pu-239/240.

The comparisons of field duplicates are included in [Table B.1-4](#). All of the field duplicate comparisons were within the control limits except for one uranium RPD. No field samples were qualified based on the RPD being outside control limits.

**Table B.1-4
Field Duplicate Precision for Radioanalytes**

	Gamma Spectroscopy	Isotopic Uranium	Isotopic Plutonium
Relative Percent Difference			
Number Performed	17	19	0
Number Within Limits	17	18	0
Percent Within Limits	100	95	NA
Normalized Difference			
Number Performed	166	8	8
Number Within Limits	166	8	8
Percent Within Limits	100	100	100

NA = Not applicable

B.1.1.1.3 Precision Summary

Overall, the precision for CAU 410 measurements were within the DQI specifications. Accounting for sample heterogeneity, the precision of the dataset for chemical analyses is demonstrated to be very high. Laboratory measurement error associated with analytical measurement variability is well within acceptable limits. Laboratory and field precision tests were performed for gamma spectroscopy, isotopic uranium, and isotopic plutonium. All the measurements were within the control limits except one uranium RPD and three gamma duplicates compared using the normalized difference.

B.1.1.2 Accuracy

Accuracy is a measure of the closeness of an individual measurement or the average of a number of measurements to the true value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that result from sampling and analytical operations.

B.1.1.2.1 Accuracy for Chemical Analyses

Accuracy is determined by analyzing a reference material of known pollutant concentration or by reanalyzing a sample to which a material of known concentration or amount of pollutant has been added (spiked). Accuracy is expressed as %R for the purposes of evaluating the quality of data reported for CAU 410.

Matrix spike samples are prepared by adding a known concentration of a target analyte to a specified amount of matrix sample for which an independent estimate of the target analyte concentration is available. Spiked samples are used to determine the laboratory's overall efficiency by comparing the percent recovered to the known true value. For example, a sample that is spiked with 10 ppm of a known analyte should produce a reported result of 10 ppm greater than the value of the sample itself. Consequently, the accuracy for this analysis would be reported as 100 percent. Matrix spike recoveries within the specified criteria for organic and inorganic analyses indicate the laboratory is operating within established controls and producing valid, quality results. Matrix spike results outside the control limits for organic analyses may not result in qualification of the data. An assessment of the entire analytical process is performed to determine the quality of the data and whether qualification is necessary.

Laboratory control samples are generated to provide accuracy of analytical methods and laboratory performance. They are prepared, extracted (as required by method), analyzed, and reported once per SDG, per matrix. For organic analyses, laboratory control limits are used to evaluate the accuracy of all analyses. The control limits are evaluated at the laboratory quarterly by monitoring the historical data and performance for each method. The acceptable limits for inorganic analyses are established in the EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 1994). Sample results within established control ranges for organic and inorganic analyses show that the analytical method is accurate and the data provided are valid.

Surrogates (System Monitoring Compounds) are used to assess the method performance for each sample analyzed for organic analyses. Control limits established by the laboratory are used to evaluate the accuracy of the surrogate recoveries. Factors beyond the laboratory's control, such as sample matrix effects, can cause the measured values to be outside of the established criteria.

Therefore, the entire sampling and analytical process must be evaluated when determining the quality of the analytical data provided.

[Table B.1-5](#) identifies the number of matrix spike, laboratory control, and surrogate measurements performed for CAU 410. The table presents the total number of measurements analyzed, the number of measurements within the specified criteria, and the percent-accuracy of each method. Method-specific accuracy is determined by taking the number of measurements within criteria, dividing that by the total number of measurements analyzed, and multiplying by 100. For organic analyses, each sample had surrogates analyzed; therefore, the number of surrogates is significantly greater than the number of matrix spike and laboratory control samples.

The MS accuracy results for organic analyses in [Table B.1-5](#) include the total number of MS measurements per analysis and the number of MS measurements within criteria. All samples for organic analyses within the associated SDG are not qualified, only the native sample in which the spike was added. Inorganic MS results outside of the established control criteria do result in data qualified as estimated for all the samples in that batch. However, only the analyte(s) outside of control requires qualification.

[Table B.1-5](#) includes the total number of LCS measurements per analysis and the number of LCS measurements within criteria. Laboratory control samples within the specified criteria for organic and inorganic analyses indicate the laboratory is producing valid data. Laboratory control samples outside of the established criteria result in the qualification of inorganic data and may result in the qualification of organic data. For organic analyses, an evaluation of the overall analytical process is performed to determine if data qualification is necessary. Inorganic LCS recoveries outside of established controls require data to be qualified for the individual analyte out of control. If the LCS criteria are not met, the laboratory performance and method accuracy are in question.

Surrogates reported within established control criteria indicate good laboratory method performance and the absence of matrix influences on the samples and result in quality, valid data. [Table B.1-5](#) includes the total number of sample measurements performed for each method and the total number of sample measurements qualified for surrogate recoveries exceeding criteria. The estimated organic data in this CAU do not necessarily indicate the data is not useful. Data qualification is one factor to be considered in the overall assessment of the data quality and the impact to the project's objectives.

**Table B.1-5
Laboratory Accuracy Measurements for CAU 410**

	ORGANICS								INORGANICS	
	VOCs	SVOCs	TPH-DRO	TPH-GRO	EXPLOSIVES	PESTICIDES	PCBS	HERBICIDES	METALS	MERCURY
Matrix Spike (MS) Accuracy										
Total Number of MS Measurements	90	198	22	18	210	36	12	18	86	14
Total Number of MS Measurements Within Criteria	90	198	21	15	209	31	11	17	86	14
MS % Accuracy	100	100	95.45	83.33	99.52	86.11	91.67	94.44	100	100
Laboratory Control Sample (LCS) Accuracy										
Total Number of LCS Measurements	260	352	36	34	364	84	28	42	268	36
Total Number of LCS Measurements Within Criteria	260	351	36	34	364	84	28	42	268	36
LCS % Accuracy	100	99.72	100	100	100	100	100	100	100	100
Surrogate Accuracy										
Total Number of Measurements Analyzed	8553	6945	108	88	1092	630	223	300	NA	NA
Total Number of Measurements not Affected by Out-of-Control Surrogates	8551	6939	107	88	1092	558	196	300	NA	NA
Surrogate % Accuracy	99.98	99.91	99.07	100	100	88.57	87.89	100	NA	NA

Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Selenium, Nickel

Accuracy for the measurement of target analytes collected at CAU 410 was determined for RCRA metals and beryllium, VOCs, SVOCs, TPH-DRO and TPH-GRO, explosives, pesticides, PCBs, and herbicides.

For the purpose of determining data accuracy of sample analysis for CAU 410, all water and soil samples including field QC samples (i.e., trip blanks, equipment rinsate samples, field blanks) were evaluated and incorporated into the accuracy calculation.

B.1.1.2.2 Accuracy for Radiological Analyses

Laboratory control samples and MS samples are used to determine the accuracy of radioanalytical measurements. The LCS is prepared by adding a known concentration of the radionuclide being measured to a sample that doesn't contain radioactivity (i.e., distilled water). This sample is analyzed with the field samples using the same sample preparation, reagents, and analytical methods employed for the samples. One LCS is prepared with each batch of samples for analysis by a specific measurement. The MS samples are prepared by adding a known concentration of the target radionuclide to a specified field sample with a measured concentration.

The accuracy of the LCS determination is expressed as a percent recovery by the following:

$$\% \text{ Recovery (\%R)} = \frac{\text{Amount of Analyte Measured}}{\text{Amount of Analyte Added}} \times 100$$

If the LCS results are outside acceptable control limits, qualifiers will be added to the field samples analyzed with the LCS.

[Table B.1-6](#) and [Table B.1-7](#) gives the number of laboratory control samples and matrix spike samples, including soil and water matrices, measured for each radiochemical measurement for CAU 410. The percent accuracy for the procedure is determined as the number of LCS or MS measurements that are within the control limits divided by the total number of analyses, multiplied by 100.

**Table B.1-6
Radioanalytical Laboratory Control Sample (LCS) Accuracy**

	Gamma Spectroscopy	Isotopic Uranium	Isotopic Plutonium
Total Number	59	48	17
Total Number within Criteria	59	48	17
LCS % Accuracy	100	100	100

**Table B.1-7
Radioanalytical Matrix Spike (MS) Accuracy**

	Gamma Spectroscopy	Isotopic Uranium	Isotopic Plutonium
Total Number	NA	4	2
Total Number within Criteria	NA	4	2
MS % Accuracy	NA	100	100

NA = Not applicable

Laboratory control samples within the specified criteria for radiological analyses indicate the laboratory is producing valid data. If the LCS criteria are not met, the laboratory performance and method accuracy are in question. Radiological LCS recoveries outside of established controls require data to be qualified for the individual radionuclide that is out of control. Since LCS recoveries were 100 percent for all analyses, no field samples were qualified based on LCS performance.

None of the MS recoveries were outside of control limits.

B.1.1.2.3 Accuracy Summary

Overall, the accuracy for CAU 410 was within acceptable limits. Of the 17,939 chemical surrogate measurements, 17,831 or 99 percent were not affected by out of control surrogates. Of the 2,208 chemical MS and LCS measurements, 2,195 or 99 percent were within criteria. All of the

radioanalyte LCSs were within criteria. Therefore, the measurements for CAU 410 are considered valid in regard to accuracy.

B.1.1.3 Completeness

Completeness is defined as the acquisition of sufficient data of the appropriate quality to satisfy DQO decision data requirements. A measure of completeness is the amount of data that are judged to be valid. Percent completeness for sample analyses was determined by dividing the total number of samples analyzed (per method) by the total number of samples sent to the lab and multiplied by 100. Percent completeness for measurement usability (not rejected) was determined by dividing the total number of unrejected measurements by the total number measurements (per method) and multiplied by 100. All measurements for completeness include reanalyses. [Table B.1-8](#) and [Table B.1-9](#) contain results of completeness per analytical method.

The specified sampling locations were used as planned and all samples were collected as specified in the CAU 410 CAIP (NNSA/NV, 2002a). Trip blank sample TB41003316 VOC analysis was cancelled because the label read “EMAX TEMP BLANK.”

In accordance with the CAU 410 CAIP (Table 6-1), 80 percent of CAS-specific noncritical samples and analyses had valid results. All of CAS-specific critical parameters had valid results with the exception of CAS TA-21-002-TAAL, which had U-234, U-235, and U-238 results rejected for samples 410AL520 and 410AL521. However, the laboratory reanalyzed both of these samples and the results were acceptable for the purpose of waste determination.

The analytical results for two VOC analyses were rejected because sample temperature was not documented during storage. The analytical results for three SVOC analyses were rejected due to possible matrix effects or because internal standard area count exceeded the QC limits. These rejected data do not affect closure decisions because data from other depths can be used.

The CAU 410 dataset provides sufficient information to support the decisions and meets the data quality objectives for completeness stipulated in the CAIP.

**Table B.1-8
Chemical Completeness for CAU 410**

Completeness Parameters	ORGANICS								INORGANICS	
	VOCs	SVOCs	TPH-DRO	TPH-GRO	EXPLOSIVES	PESTICIDES	PCBs	HERBICIDES	METALS	MERCURY
Sample Analysis Completeness										
Total samples sent to Lab	126	97	108	88	78	30	33	30	108	95
Total samples analyzed	125	97	108	88	78	30	33	30	108	95
Total samples not analyzed by the lab	1	0	0	0	0	0	0	0	0	0
-Analyses cancelled per Shaw	1									
Percent Completeness	99.21	100	100	100	100	100	100	100	100	100
Measurement Usability Completeness										
Total measurements **	8553	6945	108	88	1092	630	244	300	750	95
Total measurements rejected - Field	0	0	0	0	0	0	0	0	0	0
Total measurements rejected - Lab/Matrix	28	29	0	0	0	0	0	0	0	0
Percent Completeness	99.67	99.58	100	100	100	100	100	100	100	100

Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Selenium, Silver

**Measurements include reanalyses

**Table B.1-9
Radiological Completeness for CAU 410**

Completeness Parameters	Gamma Spectrometry	Isotopic Uranium	Isotopic Plutonium
Sample Analysis Completeness			
Total samples sent to Lab	99	122	71
Total samples analyzed	99	122	71
Percent Completeness	100	100	100
Measurement Usability Completeness			
Total measurements **	2,210	372	142
Total measurements rejected - Field	0	0	0
Total measurements rejected - Lab/Matrix	16	6	0
Percent Completeness	99.28	98.39	100

**Measurements include reanalyses

B.1.1.3.1 Rejected Data

Data identified as unusable and qualified as rejected “R” during Tier II data validation is presented in [Table B.1-10](#).

B.1.1.4 Representativeness

A seven-step DQO process was utilized to identify CAU 410 requirements. During the process, locations were selected that enabled the samples collected to be representative of the media being evaluated. Samples were collected as planned. Quality control blanks are used as a way of measuring outside factors that could impact sample results. No data was rejected due to QC blanks. Therefore, the analytical data acquired during the CAU 410 investigation are representative of site characteristics and the dataset satisfies the data quality objectives for representativeness stipulated in the CAIP.

B.1.1.5 Comparability

Field sampling activities were performed and documented in accordance with approved procedures that are comparable to standard industry practices. Approved standardized methods and procedures

Table B.1-10
CAU 410 Rejected Data
(Page 1 of 2)

Sample Number	Laboratory Method	Parameter	Sample Matrix
TA-21-003-TANL			
410NL003	HASL300	Radium-226	Soil
410NL003	HASL300	Thorium-227	Soil
CAS 09-21-001-TA09			
41009001	EPA8260	1,2-Dibromo-3-Chloropropane	Soil
41009001	EPA8260	Bromomethane	Soil
41009001	HASL300	Radium-226	Soil
41009001	HASL300	Thorium-227	Soil
41009002	EPA8260	1,2-Dibromo-3-Chloropropane	Soil
41009002	EPA8260	Bromomethane	Soil
41009003	EPA8260	1,2-Dibromo-3-Chloropropane	Soil
41009003	EPA8260	Bromomethane	Soil
41009003	HASL300	Radium-226	Soil
41009003	HASL300	Thorium-227	Soil
CAS TA-19-002-TAB2			
410B2001	HASL300	Radium-226	Soil
410B2003	HASL300	Radium-226	Soil
410B2003	HASL300	Thorium-227	Soil
410B2004	HASL300	Radium-226	Soil
CAS TA-21-001-TAAL			
410AL001	EPA8260	1,2-Dibromo-3-Chloropropane	Soil
410AL001	EPA8260	Bromomethane	Soil
410AL001	HASL300	Radium-226	Soil
410AL001	HASL300	Thorium-227	Soil
410AL002	EPA8260	1,2-Dibromo-3-Chloropropane	Soil
410AL002	EPA8260	Bromomethane	Soil
410AL003	EPA8260	1,2-Dibromo-3-Chloropropane	Soil
410AL003	EPA8260	Bromomethane	Soil
410AL003	HASL300	Radium-226	Soil
410AL515	HASL300	Thorium-234	Soil
410AL520	ISOU	Uranium-234	Soil
410AL520	ISOU	Uranium-235	Soil

Table B.1-10
CAU 410 Rejected Data
(Page 2 of 2)

Sample Number	Laboratory Method	Parameter	Sample Matrix
CAS TA-21-001-TAAL			
410AL520	ISOU	Uranium-238	Soil
410AL521	HASL300	Americium-241	Soil
410AL521	ISOU	Uranium-234	Soil
410AL521	ISOU	Uranium-235	Soil
410AL521	ISOU	Uranium-238	Soil
CAS 03-19-001			
41003009	EPA8270	Benzo(A)Pyrene	Soil
41003009	EPA8270	Benzo(B)Fluoranthene	Soil
41003009	EPA8270	Benzo(G,H,I)Perylene	Soil
41003009	EPA8270	Benzo(K)Fluoranthene	Soil
41003009	EPA8270	Dibenzo(A,H)Anthracene	Soil
41003009	EPA8270	Indeno(1,2,3-CD)Pyrene	Soil
41003009	HASL300	Aluminum-26	Soil
41003317	EPA8270	3,3'-Dichlorobenzidine	Liquid
41003317	EPA8270	Benzo(A)Anthracene	Liquid
41003317	EPA8270	Benzo(A)Pyrene	Liquid
41003317	EPA8270	Benzo(B)Fluoranthene	Liquid
41003317	EPA8270	Benzo(G,H,I)Perylene	Liquid
41003317	EPA8270	Benzo(K)Fluoranthene	Liquid
41003317	EPA8270	Butyl Benzyl Phthalate	Liquid
41003317	EPA8270	Chrysene	Liquid
41003317	EPA8270	Dibenzo(A,H)Anthracene	Liquid
41003317	EPA8270	Indeno(1,2,3-CD)Pyrene	Liquid
41003317	EPA8270	Pyrene	Liquid
41003317RR1	EPA8270	Benzo(A)Pyrene	Liquid
41003317RR1	EPA8270	Benzo(B)Fluoranthene	Liquid
41003317RR1	EPA8270	Benzo(G,H,I)Perylene	Liquid
41003317RR1	EPA8270	Benzo(K)Fluoranthene	Liquid
41003317RR1	EPA8270	Dibenzo(A,H)Anthracene	Liquid
41003317RR1	EPA8270	Indeno(1,2,3-CD)Pyrene	Liquid

were also used to analyze, report, and validate the data. Therefore, datasets within this project are comparable to all other datasets generated using standardized quality procedures.

B.1.2 Reconciliation of DQOs to Conceptual Site Model

This section provides a reconciliation of the data collected and analyzed during this investigation with the preliminary conceptual site models established in the DQO process.

B.1.2.1 Initial Conceptual Site Models

A single CSM was developed for CAU 410 as presented in the CAIP (NNSA/NV, 2002) based on historical information, geophysical and radiological surveys from July 2002, and process information. This data assessment reconciles the investigation results with the CSM.

The single CSM developed for CAU 410 depicts scenarios where there is a presence of buried debris in the disposal features. The model assumed that if any contaminant was present, it would be located in the subsurface and the extent would be confined laterally within the historic boundaries of the disposal feature, and the potential for vertical migration would be minimal based on geological and historical information for the sites.

B.1.2.2 Investigation Design and Contaminant Identification

The CSMs were used as the basis for developing the investigation design, which includes identifying appropriate sampling strategies and data collection methods.

To address the CSM, surface and subsurface samples were collected for analyses designed to define the extent of the anomalies identified in the CAIP. A biased strategy was developed to focus the investigation on areas of potential contamination. The CSMs assumed that the contamination would be limited to the boundaries of the site due to the minimal potential for migration based on the geological and historical information for the site.

Implementation of the investigation design has shown that contamination did not extend beyond the disposal feature; therefore, it did not extend beyond the boundaries of the CAS. This is reasonable

because the model predicts that the extent of impact of any contaminated effluent released to soil is limited (NNSA/NV, 2002a).

B.1.2.3 Contaminant Nature and Extent

The model assumed that the contamination would be limited to the boundaries of the site due to the minimal potential for migration based on the geological and historical information for the site. The investigation was performed according to design concepts and has shown the extent of the contamination did not exceed the boundaries of the CAS.

B.1.3 Conclusions

The DQIs (e.g., precision, accuracy, completeness, representativeness, and comparability) were all evaluated for quality and impact to the data. All of the data, except data qualified as rejected, can be used in project decisions.

B.2.0 References

- U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.
2002a. *Corrective Action Investigation Plan for Corrective Action Unit 410: Waste Disposal Trenches, Tonopah Test Range, Nevada*, Rev. 0, DOE/NV--827. Las Vegas, NV.
- U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office.
2002b. *Industrial Sites Quality Assurance Project Plan, Nevada Test Site, Nevada*, Rev. 3, DOE/NV--372. Las Vegas, NV.
- U.S. Environmental Protection Agency. 1994. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540-R-94/013. Washington, DC: U.S. Government Printing Office.
- U.S. Environmental Protection Agency. 1996. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846* CD ROM PB97-501928GEI, which contains updates for 1986, 1992, 1994, and 1996. Washington, DC.

Appendix C

Risk Assessment for CAU 410

C.1.0 Risk Assessment

A detailed assessment of risk for no action and an evaluation of alternatives was not performed for this CAU because there are no COCs exceeding PALs remaining at the CAU to impact human health or the environment.

Several sample locations had detections of uranium and gamma-emitting isotopes above their associated PALs; however, the concentrations were shown to be indistinguishable from the PALs based on a normalized difference test. [Appendix A, Section A.2.7](#), details the supporting documentation regarding radioisotopes.

Arsenic exceeded the PALs at a few of the soil sample locations at CAU 410. [Appendix A, Section A.2.7](#), details the findings and supporting documentation regarding arsenic. Arsenic levels are elevated at the CAU due to the soils in the region and are not considered a threat to human health or the environment.

No use restrictions are placed on any of the five CASs because any subsurface debris and contaminated soil were excavated and disposed during supplemental characterization activities.

Appendix D

Closure Activities and Waste Disposition for CAU 410

D.1.0 Introduction

This appendix details closure activities that resulted from performing best management practices and waste management (WM) practices for waste generated during the course of supplemental investigation activities at the CASs of CAU 410. This CAU is located at the TTR near Tonopah, Nevada.

During and at the completion of excavation activities at CASs where supplemental field activities were implemented (i.e., CAS 03-19-001, CAS TA-21-002-TAAL, and CAS TA-19-002-TAB2), verification and waste characterization samples were collected and analyzed to support both site characterization and the disposal of IDW generated during supplemental field activities. All samples were analyzed in accordance with the requirements in the CAIP. For waste determinations, analytical results are compared to applicable regulations and disposal site acceptance criteria for hazardous and radiological waste. Analytical data for waste characterization samples are not specifically provided; however, they are maintained in project files and are available upon request.

D.2.0 Closure Activities

Closure activities at CAU 410 were conducted as a BMP to properly remove various types of waste generated during characterization activities. The various types of waste consisted of nonhazardous soil and debris, TPH-contaminated soil, depleted uranium-contaminated soil and debris, and UXO. The following sections describe the closure activities and BMP performed over the course of the CAI for each CAS.

D.2.1 CAS TA-21-003-TANL and CAS 09-21-001-TA09, Disposal Trenches

No closure activities were performed at these two CASs because initial investigation results indicated no COPCs were present above PALs; therefore, no further characterization was required.

D.2.2 CAS TA-19-002-TAB2, Debris Mound

Initial investigation found DU and UXO; therefore, supplemental field activities were conducted which involved the removal of all debris and contaminated soil in order to properly characterize the subsurface. The segregated waste resulted in stockpiled DU-contaminated soil with miscellaneous debris, a large metal pan, drogue chutes, and various UXO. [Figure A.5-1](#) in [Appendix A](#) depicts the type of debris encountered. As a BMP, the waste was not replaced into the excavation but rather, it was disposed as LLW as described in the CAIP ROTC No. 4. The UXO was determined to be either inert (cluster bomb submunitions) or potentially live (one fuze) by USAF EOD personnel. The following closure activities, performed as BMP and WM practices, were completed and no further action is required at this CAS:

- Conducted radiological surveys of debris for waste determination.
- Segregated all UXO from soil and debris and properly disposed by either demilitarization or recycling.
- Collected waste characterization samples for waste determination.
- Loaded DU-waste directly into B25 boxes, 55-gallon drums, and a transportainer in March 2003 to reach subsurface soils for characterization purposes (see [Figure D.2-1](#)).
- Stockpiled remaining DU waste in March 2003 for eventual disposal.

Figure D.2-1
DU-Waste Containers at Bunker 2
(Photo taken March 2003)

- Loaded remaining DU waste into soft-sided containers in August 2003 for disposal.
- Collected verification samples and analyzed from former locations of metal pan and DU-waste stockpile staging area.
- Transported and disposed approximately 55 tons of LLW to the NTS between August 28 and September 24, 2003.
- Backfilled the excavation on December 2, 2003, with clean sand/gravel from the TTR gravel pit (see [Figure D.2-2](#)).
- Transported and disposed of two 55-gallon drums of nonhazardous, nonradioactive solid waste to the U10C disposal site at the NTS on December 3, 2003.

D.2.3 CAS TA-21-002-TAAL, Disposal Trench

As a BMP, IDW generated during the site characterization of the disposal trench was segregated, stockpiled, and eventually disposed rather than being returned to the excavation due to the large amount of debris and the subsequent identification of DU contamination. One exception to disposal was the soil from Stockpile No. 3. This contaminant-free and relatively debris-free overburden soil

Figure D.2-2
Backfilled Excavation
(Backfilled Excavation at Bunker 2;
Photo taken December 5, 2003)

was used as backfill material. The following closure activities, performed as BMP and WM practices, were completed and no further action is required at this CAS:

- Stockpiled all nonhazardous soil and debris.
- Segregated wire/cable bundles and large scrap metal.
- Stockpiled DU-contaminated soil/debris.
- Stockpiled UXO into HWAAs prior to demilitarization activities.
- Conducted radiological surveys of debris for waste determinations.
- Collected waste characterization samples from all stockpiles for waste determinations.
- Collected verification samples during characterization activities of sidewalls and floor of excavation.
- Backfilled the excavation with clean sand/gravel from the TTR gravel pit (see [Figure D.2-3](#)).

- Disposed nonhazardous aluminum scrap and inert/demilitarized UXO to recycle piles.
- Demilitarized all intact and potentially live UXO (6 separate episodes).
- Disposed approximately 1,600 tons of municipal solid waste to the TTR Piot Construction Landfill (see [Figure D.2-4](#)).
- Loaded approximately 65 tons of DU-waste into soft-sided containers in September 2003.
- Transported and disposed approximately 65 tons of LLW to the NTS on September 22 and 23, 2003.
- Collected verification samples from the DU-waste stockpile staging areas after disposal.
- Transported and disposed of one 55-gallon drum of nonhazardous, nonradioactive solid waste to the U10C disposal site at the NTS on December 3, 2003.

Figure D.2-3
Backfilled Excavation
(Backfilled excavation at Antelope Lake;
Photo taken July 31, 2003)

**Figure D.2-4
Waste Hauling**

(Loading solid municipal waste at Antelope Lake;
Photo taken July 17, 2003)

D.2.4 CAS 03-19-001, Waste Disposal Site

During the course of characterization activities, a large amount of soil mixed with debris was encountered at this CAS as part of what is referred to as the “burn pit.” As a BMP, and in order to properly characterize the nature and extent of potential contamination, all debris was excavated from the “burn pit” area. Materials removed from the excavation deemed to have a large percentage of debris were stockpiled for later disposal as nonhazardous waste. Clean overburden or relatively debris-free soil was segregated, when possible, for later use as backfill. Additionally, during the course of determining extent of TPH-contaminated soil in the southern portion of the CAS footprint, all potentially contaminated soil was stockpiled on plastic for eventual disposal. The following closure activities, performed as BMP and WM practices, were completed and no further action is required at this CAS.

- Stockpiled visually stained soil and debris from the burn pit excavation.
- Stockpiled contaminated soil and debris from the TPH excavation.

- Collected verification samples from sidewalls and floor of the excavation.
- Collected waste characterization samples from soil.
- Disposed approximately 300 tons of municipal solid waste to the TTR Piot sanitary landfill.
- Disposed approximately 230 tons of TPH-contaminated soil and debris to the NTS Area 6 hydrocarbon disposal site.
- Backfilled the excavation with both overburden soil determined clean through field-screening and/or sample analysis and clean sand/gravel from the TTR gravel pit.
- Regraded the surface as close to original grade as possible (see [Figure D.2-5](#) and [Figure D.2-6](#)).

Figure D.2-5
Backfilled Excavation
(CAS 03-19-002 after solid municipal waste removed and excavation backfilled; Photo taken July 17, 2003)

The BMP closure activities for all CASs were completed by December 3, 2003. These activities performed throughout the CAU 410 corrective action investigation resulted in the removal of all residual contamination or debris in the subsurface; thus, warranting the combination of the CADD and CR into one report because no further action is recommended at this CAU.

Figure D.2-6
CAS 03-19-001 Closure
(Excavation and hauling of all waste completed;
Photo taken July 31, 2003)

D.3.0 Waste Management

Investigation-derived waste was generated during the field activities of CAU 410. The waste streams include decontamination rinse water, disposable personal protection equipment (PPE), field-screening waste, disposable sampling equipment, contaminated soil and debris, and UXO. The types, amounts, and disposal of the waste are detailed in the following subsections. Newly generated wastes such as rinsate and PPE/sampling debris (plastic/glass) have been characterized based on the associated soil samples and/or direct sampling (e.g., rinsate). For waste containers not sampled directly, process knowledge and analytical results of corresponding soil samples were used instead.

D.3.1 Waste Minimization

Corrective Action Unit 410 integrated waste minimization into the field activities. The IDW was segregated to the greatest extent possible. Controls were in place to minimize the use of hazardous materials and unnecessary generation of hazardous and/or mixed waste. Decontamination activities were planned and executed to minimize the volume of rinsate generated.

D.3.2 Waste Characterization

Analytical results and/or process knowledge for each waste container, stockpile, and/or associated samples were reviewed against federal regulations; state regulations; DOE Directives, Policies, and Guidelines; Waste Disposal Criteria; and standard quality practices.

- The IDW generated by site characterization activities at CAU 410 is a solid waste according to 40 CFR Part 261.2.
- 40 CFR 261.3(a)(2)(iv), 261.4, and 261.6(a)(3) were reviewed to determine if the waste was excluded from regulation as a solid waste or hazardous waste. The waste is not excluded from regulation as a solid waste or hazardous waste.
- Analytical results and knowledge of the waste were used to determine if the waste met criteria as a hazardous waste in Subpart C, "Characteristics of Hazardous Waste," as per 40 CFR 261.24. The soil wastes were not considered hazardous; however, potentially live UXO was managed as D003 hazardous waste during storage because of its potential reactivity and as a mixed waste if the UXO was radioactively contaminated with DU.

- The F-coded waste discussed in 40 CFR 261.31, “Hazardous Waste From Non-Specific Sources,” are applicable to one waste stream. The Petroflag and RDX field-screening kits used for CAU 410 generated spent solvents. As a result, the EPA waste codes F003 and D001 were applied to field-screening waste contained in SAA 41003s01. However, sampling the solvent wastes in drum 41003s01 used all remaining waste. Therefore, no disposal was required.
- K-codes as discussed in 40 CFR 261.32, “Hazardous Wastes from Specific Sources,” are not applicable to these sites.
- The P- and U-codes as discussed in 40 CFR 261.33, “Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues Thereof,” are not applicable to these sites.
- The *Toxic Substances Control Act* (TSCA) regulation, which governs the storage and disposal of PCB waste, is not applicable to these sites as PCB analytical results were not above 50 mg/kg as defined at 40 CFR 761.3.
- Based on analytical results and demilitarization activities, no mixed waste was generated at these sites.
- The State of Nevada has set a regulatory action limit for hydrocarbon-impacted soils of 100 mg/kg. The TPH-DRO analytical results for samples at CAS 03-19-001 were compared to this regulatory limit.
- Analytical results and knowledge of the waste were used to determine if the DU-waste met the waste acceptance criteria for the NTS Area 3 and Area 5 RWMS and/or the U10C disposal site.

D.3.2.1 Waste Streams

The IDW that was generated by site characterization activities at CAU 410 was segregated into the following waste streams:

- Sanitary waste including but not limited to PPE, disposable sample equipment, glass/plastic sample jars, sampling scoops, aluminum foil, and other debris such as plastic sheeting, boxes, sand bags, etc.
- Decontamination rinsate
- Hydrocarbon solids (e.g., soil and debris)
- Municipal solid waste (e.g., soil and debris)

- Field-screening waste (spent solvents from RDX and TPH kits)
- Ordnance solid waste
- Depleted uranium LLW (e.g., soil and debris)

D.3.2.2 Waste Sampling

Waste determinations were made utilizing process knowledge and media sample association. Direct sampling was performed to confirm the regulatory status of IDW (i.e., rinsate and stockpiled soil), where necessary.

D.3.3 Storage

The potentially hazardous and radiological IDW generated at CAU 410 was managed in various ways depending on the nature and volume of the IDW. The types of accumulation and/or storage used for CASs that generated IDW are as follows:

- One Satellite Accumulation Area (SAA) at the Area 3 office for potentially hazardous decontamination rinsate
- One SAA at the Area 3 office for hazardous waste generated by field-screening kits
- At CAS 03-19-001: one HWAA for potentially hazardous decontamination rinsate, one stockpile for municipal solid waste, and one stockpile for solid TPH-contaminated IDW
- At CAS TA-19-002-TAB2: one SAA for the potentially hazardous UXO, one RMA for the DU-contaminated stockpile, one Radiological Controlled Area for two drums staged in Area 3 for solid waste, and U.S. Department of Transportation (DOT)-compliant waste containers to include five B25 boxes, seven 55-gallon drums, and one transportainer for DU waste
- At CAS TA-21-002-TAAL, five separate HWAA's for potentially hazardous UXO, one RMA for radiological IDW, one Radiological Contamination Area (RCA) for the DU-contaminated IDW stockpile, four stockpiles of municipal solid waste, and one RCA for one drum staged in Area 3 for solid waste

Hydrocarbon waste was stockpiled on plastic sheeting and covered with plastic sheeting to prevent run-on and run-off pending disposal. Municipal solid waste was stockpiled and managed as sanitary waste (i.e., no plastic sheeting). Depleted uranium-contaminated waste was not placed on plastic

sheeting due to the necessity of moving the stockpile while excavating; the stockpile was covered with plastic sheeting pending eventual disposal to prevent run-on/runoff and wind erosion.

All potentially hazardous and/or radiological materials that were stored in 55-gallon DOT specification steel drums were labeled as “Hazardous Waste - Pending Analysis” and/or “Radiological Waste - Pending Analysis.” All potentially radioactive materials placed in DOT-approved B25 boxes and the transportainer were labeled as “Radiological Waste - Pending Analysis.” The field-screening waste was labeled as “Hazardous Waste” and marked with hazardous waste codes D001 and F003. The amount, type, and source of waste placed into waste containers was recorded in waste management logbooks at each CAS, where applicable.

Due to the risk to worker health and safety in handling UXO waste and as agreed upon by NDEP, ROTC No. 4 was generated for the CAIP. In accordance with ROTC No. 4, UXO suspected of retaining the characteristic of reactivity (i.e., not determined inert by experts) was placed on the ground in a bermed area, cordoned off and posted as either a SAA or HWAA pending demilitarization.

D.3.4 Waste Disposal

The following paragraphs summarize the types and amounts of waste generated and disposed during the CAU 410 investigation:

- All PPE and disposable sampling equipment generated during site characterization was determined to be sanitary based on observations and process knowledge. The waste was bagged, labelled, and placed in a dumpster for disposal in a sanitary landfill.
- A total of 2 drums of decontamination rinsate were generated and characterized as sanitary waste, as determined through direct sampling. The sanitary waste was disposed at the TTR Area 3 wash down pad.
- One drum of spent solvents from field-screening kits was characterized as F003 and D001 hazardous waste; however, after direct sampling of the drum contents (less than one quart) no existing waste remained for disposal.
- PPE and the decon liner used during packaging operations of DU waste were disposed of within the LLW containers and transported to the NTS.

- [Table D.3-1](#) summarizes the types of solid waste and materials that were hauled and/or disposed from CAU 410 and consists of the following:
 - Approximately 265 tons of soil and debris were characterized as hydrocarbon waste and disposed at the NTS Area 6 hydrocarbon disposal site.
 - Approximately 1,910 tons of soil and debris were characterized as municipal solid waste and disposed at the TTR Piot sanitary landfill.
 - Approximately 120 tons of soil and debris containerized in 5 B25 boxes, 7 55-gallon drums, 1 sealand container, and 11 soft-sided sacks were characterized as LLW and disposed at the Area 3 and Area 5 RWMS at the NTS.
- Three drums of soil IDW were generated during additional soil removal activities in October 2003 and were characterized as sanitary waste. The drums were disposed of in the U10C disposal site at the NTS.
- Based on the opinion of USAF EOD personnel, some of the UXO segregated during characterization activities posed an imminent and substantial endangerment to human health and the environment if left untreated. Therefore, in accordance with 40 CFR 264.1(g)(8)(i)(D) and NDEP approval, the waste UXO was treated in place (i.e., demilitarized), exclusive of RCRA permitting requirements. The number and types of treated waste UXO and the dates of demilitarization are presented in [Table D.3-2](#). The demilitarized UXO scrap was then disposed of in the USAF recycle piles located on range.
 - The UXO contaminated with DU required demilitarization to qualify for final disposition into the LLW disposal sites on the NTS (see [Table D.3-2](#)). The DU-contaminated UXO scrap was then packaged with other contaminated IDW and disposed of at the Area 3 and Area 5 RWMS at the NTS.
 - The UXO determined inert and not contaminated with DU was disposed of in the USAF recycle piles located on range (see [Table D.3-3](#)).
 - Photo documentation depicting portions of the demilitarization and recycling of CAU 410 UXO is provided in [Figure D.3-1](#) through [Figure D.3-4](#).

**Table D.3-1
Solid Waste Disposal**

Amount and Dates of CAU 410 Solid Waste Disposal (in Tons)				
Hauling/Disposal Date	Waste Designation			
	A3	AL	HC	DU
5/14/2003	0	3.3	0	0
7/16/2003	301.5	0	0	0
7/17/2003	0	463.2	0	0
7/18/2003	0	228.8	0	0
7/21/2003	0	441.5	0	0
7/22/2003	0	409.4	0	0
7/23/2003	0	61.4	69.9	0
7/24/2003	0	0	45.6	0
7/28/2003	0	0	74.0	0
7/29/2003	0	0	74.5	0
8/28/2003	0	0	0	20.4
9/24/2003	0	0	0	98.6
TOTAL Tons	301.5	1607.6	264.0	119.0
Volume (yd³)¹	201.0	1071.733	176.0	79.4

¹Volume calculated by dividing tonnage by 1.5 factor

A3 = Area 3 solid waste hauled to TTR landfill

AL = Antelope Lake solid waste hauled to TTR landfill

HC = Hydrocarbon waste hauled to NTS landfill

DU = Low-level waste hauled to NTS landfill; the dates reflect the date of transport off-site, not the dates of waste loading into containers

Table D.3-2
UXO Demilitarization Activities for CAU 410

Dates of U.S. Air Force EOD Activities for Demilitarization						
	April 24, 2003 ¹	May 1, 2003 ²	May 13, 2003 ³	June 25, 2003 ⁴	July 17, 2003 ⁵	September 11, 2003 ⁶
Types and Number of UXO	11 - Mark 82	1- 155 mm round	3 - Mark 82	59 - BLU 63	61 - BLU 63	13 - BLU 63
	2 - Unknown	1- 105 mm round	7 - beehives			
	1 - 5-inch rocket	44 - BLU-63	1 - 155 mm round			
	2 - drill round		1 - Fuze 35 - cluster bomb submunitions			

¹Demilled portions of UXO from Antelope Lake from original excavation recovery

²Demilled portions of UXO from Antelope Lake from original excavation recovery

³Demilled all DU-contaminated UXO from Antelope Lake and Bunker 2

⁴Demilled UXO recovered during second screening of Stockpile No. 1

⁵Demilled UXO recovered during second screening of Stockpiles No. 2 and No. 4

⁶Demilled UXO recovered during second screening of DU-waste pile at Antelope Lake

NA = Not applicable

Table D.3-3
Disposal of Inert UXO for CAU 410

Inert Ordnance Transferred to U.S. Air Force Recycle Piles			
	April 28, 2003	July 31, 2003	September 11, 2003
Types and Number of UXO	774 - beehives	20 - beehives	3 - beehives
	97 - cluster bomb submunitions	4 - dispensers	N/A
	4 - SUSS rounds	N/A	N/A
	8 - TDD fuzes	N/A	N/A
	3 - Mark 84	N/A	N/A
	1 - 2,000-pound sea mine	N/A	N/A

NA = Not applicable

a. Mark-82s prior to demilitarization
(Photo taken April 24, 2003)

b. Mark-82s after demilitarization
(Photo taken April 24, 2003)

Figure D.3-1
UXO Demilitarization Activities at Antelope Lake

a. Small UXO with C-4 explosive prior to demilitarization
(Photo taken June 25, 2003)

b. Remains of small UXO after demilitarization
(Photo taken June 25, 2003)

Figure D.3-2
UXO Demilitarization Activities at Antelope Lake

a. DU-contaminated UXO prior to demilitarization
(Photo taken May 13, 2003)

b. DU-contaminated UXO after demilitarization
(Photo taken May 13, 2003)

Figure D.3-3
Demilitarization of DU-Contaminated UXO at Antelope Lake

a. Photo taken April 28, 2003

b. Photo taken April 28, 2003

Figure D.3-4
Inert UXO Transported to Recycle Pile on Range

D.4.0 Verification Sample Analyses

This section summarizes the results of verification sampling conducted during supplemental field activities at CAU 410. In the process of accessing subsurface sampling locations to adequately define the nature and extent of contamination during supplemental field activities, all removed soil, debris, and UXO were disposed as solid waste rather than being replaced into the excavation. Due to this BMP, verification samples were collected from sidewalls and floors of excavations to provide closure documentation at the following three CASs: TA-19-002-TAB2 (Bunker 2), TA-21-002-TAAL (Antelope Lake), and 03-19-001 (Area 3). For excavations up to 4 ft deep, samples were collected by hand or backhoe. At excavations over 4 ft deep or inaccessible by foot, verification samples were collected from the backhoe bucket or hollow-stem auger rig.

Additional verification samples were collected from the ground surface following the disposal of stockpiled DU-waste at the Bunker 2 and Antelope Lake sites to confirm all contaminated soils above PALs were removed. These samples were collected by hand.

D.4.1 CAS TA-19-002-TAB2

Details regarding verification sampling and analytical results for this CAS are presented in [Appendix A, Section A.5.0](#). Verification sample locations are shown in [Figure A.5-3](#). Samples 410B2007 through 410B2013 and sample 410B2024 represent the samples collected on the sidewalls and floor of the excavation. Samples 410B2009 and 410B2013 indicated elevated DU was still present in the eastern sidewall. Additional soil was removed and the sidewall resampled (410B2024) with analytical results indicating concentrations below PALs. Upon verification, the excavation was backfilled with clean sand and gravel on December 2, 2003.

Following the loading of the DU waste stockpile into waste containers, one of the initial two verification samples (410B2014) indicated residual contamination remained above PALs. Additional soil was removed from the surface on October 14 and 22, 2003, and another nine verification samples and one field duplicate were collected and analyzed (see [Figure A.5-3](#)). The analytical results were not statistically greater than PALs using the normalized difference test. Based on the verification analytical results, no further soil removal was required at CAS TA-19-002-TAB2.

D.4.2 CAS TA-21-002-TAAL

Details regarding verification sampling and analytical results for this CAS are presented in [Appendix A, Section A.6.0](#). Verification sample locations are shown in [Figure A.6-1](#). Sixteen verification samples numbered 410AL001 through 410AL016 represent the samples collected from the sidewalls and floor of the excavation. The analytical results indicate that the remaining subsurface soil has concentrations below PALs. Upon verification, the excavation was backfilled with clean sand and gravel.

Following the loading and disposal of the DU-waste stockpile into containers, four initial verification samples (410AL017 to 410AL020) were collected from the ground surface. One of the four samples (410AL018) indicated residual contamination remained above PALs. Additional soil was removed from the surface on October 14, 2003, and another eight verification samples and one field duplicate were collected and analyzed (see [Figure A.6-2](#)). The analytical results were not statistically greater than PALs using the normalized difference test. Based on these verification analytical results, no further soil removal is required at CAS TA-21-002-TAAL.

D.4.3 CAS 03-19-001

Details regarding verification sampling and analytical results for this CAS are presented in [Appendix A, Section A.7.0](#). Verification sample locations are shown in [Figure A.7-5](#) and [Figure A.7-6](#). A total of 10 verification samples (41003011 to 41003014 and 41003024 to 41003029) were collected during the investigation that represent the sidewalls and the floor of the burn pit area. All verification analytical results indicate there are no COPCs remaining in the burn pit area.

A total of 21 verification samples (41003016 to 41003023 and 41003030 to 41003042) were collected during the supplemental investigation that represent the sidewalls and floor of the TPH area. Verification analytical results indicate that the remaining soil in the TPH area of the CAS is below the NDEP action levels for TPH-DRO (100 mg/kg). Based on the verification analytical results, no further subsurface soil removal was required at either the burn pit or TPH area of CAS 03-19-001. Upon verification, the excavation was backfilled with clean sand and gravel.

D.5.0 Summary

Closure activities were completed at CAU 410 by:

- Removing and disposing of solid material (soil and/or debris) impacted by TPH-DRO or depleted uranium.
- Removing, segregating, and disposing of solid material containing large amounts of debris.
- Screening and segregating UXO from soil and debris.
- Demilitarization of potentially live UXO by USAF EOD personnel.

All solid waste that was deemed not suitable for use as backfill was disposed in accordance with applicable waste regulations as outlined in the CAIP:

- Solid waste impacted by TPH was disposed at the NTS hydrocarbon landfill.
- Solid waste impacted by depleted uranium was disposed at the Area 3 and Area 5 RWMS or the U10C disposal site.
- Municipal solid waste determined to be nonhazardous was disposed in the Piot Landfill at the TTR.
- Nonhazardous, recyclable metal scrap and inert/demilitarized UXO were disposed at the USAF recycle piles located on range.

Verification samples from sidewalls and floors of the excavations and the ground surface where contaminated soils were stockpiled were collected and met the established closure criteria.

All excavations were backfilled with clean fill taken from the TTR gravel pit and regraded as close to the original slope as possible.

It is anticipated, based on the work completed, that the site can be closed without further corrective action requirements.

Appendix E

Waste Manifests for CAU 410

(74 Pages)

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME RICKY FULLER DATE 7/28/03
LOCATION SANDIA - MERCURY
CONTRACTOR SHAW

TRUCK # Q13 SEMI END DUMP ☒
LOWBED ☐ EMPTY 33000 SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1.	<u>79340</u>	<u>600</u>	<u>1030</u>	11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 6 AM STOP TIME 4:30
LUNCH TIME 100-130 STAND BY _____
DOWNTIME _____ TOTAL TIME 10

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature [Signature]
KEEP THIS FOR REFERENCE

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME Ben Boyd DATE 7/28/03
LOCATION S3 Sandia TR
CONTRACTOR _____

TRUCK # 205/321 SEMI END DUMP ☒
LOWBED ☐ TRK 33700 SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1.	<u>TPH</u>	<u>600</u>	<u>1130</u>	11.			
2.	<u>TPH</u>	<u>45360</u>		12.			
3.	<u>DET</u>	<u>600</u>	<u>1130</u>	13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 600 STOP TIME 3
LUNCH TIME _____ STAND BY _____
DOWNTIME _____ TOTAL TIME 10

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME	DATE
	RICKY FULLER	7-23-03
LOCATION	7 TR - 1400000	
CONTRACTOR	SEAN	

TRUCK # 713

SEMI END DUMP ☒

LOWBED

SEMI BELLY DUMP ☐

33,000 - TARE

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. 78160	TPH	9.55	300	11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 9:50

STOP TIME 730

LUNCH TIME 1/2 hr LUNCH

STAND BY

DOWN TIME

TOTAL TIME 10

REMARKS:

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME	DATE
	Ray Eddington	7-28-03
LOCATION	ITR	
CONTRACTOR	SHAW	

TRUCK # 112

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

24,300 TH

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. TPH	80640	6:00	1030	11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 0600

STOP TIME 4:30

LUNCH TIME 1:30-2:00

STAND BY ~~0~~

DOWN TIME ~~_____~~

TOTAL TIME 10

REMARKS: _____

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>Ben Boyd</u>	DATE <u>7/23/03</u>
LOCATION <u>Sandia TR</u>		
CONTRACTOR <u>Shaw</u>		

TRUCK # 205/321

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

Taps 33,700

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>AI</u>	<u>86/110</u>	<u>730</u>	<u>900</u>	11.			
2. <u>TPH</u>	<u>79,600</u>	<u>1050</u>		12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 600

STOP TIME 11

LUNCH TIME _____

STAND BY _____

DOWN TIME _____

TOTAL TIME _____

REMARKS: Wire (AI) Tph to mercury
2 Fbts cannot return today

Mike was to sign on 7/24/03

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>Tony Eddington</u>	DATE <u>7-23-03</u>
LOCATION <u>TR</u>		
CONTRACTOR <u>Shaw</u>		

TRUCK # 112

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

24,300 T & W

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>TPH</u>	<u>73.160</u>	<u>9.47</u>		11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 0800

STOP TIME 7:30 ^{pm}

LUNCH TIME _____

STAND BY _____

DOWN TIME _____

TOTAL TIME 10

REMARKS: _____

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO.	DRIVER'S NAME <u>RICKY FULLY</u>	DATE <u>7-23-03</u>
LOCATION <u>TTR SANDIA</u>		
CONTRACTOR <u>SHAW</u>		

TRUCK # 213 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐

EMPTY 33000

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>6000</u>	<u>AL</u>	<u>852</u>	<u>930</u>	11.			
2.	3000	852		12.			
3.				13.			
4.				14.			
5.	<u>Net weight</u>			15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 6 AM STOP TIME 930 AM
LUNCH TIME _____ STAND BY _____
DOWNTIME _____ TOTAL TIME 3

REMARKS: HAD TO DUE PAPER
WORK FOR MERCURY

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO.	DRIVER'S NAME <u>Tony Eddings</u>	DATE <u>7-23-03</u>
LOCATION <u>TTR</u>		
CONTRACTOR <u>Shaw</u>		

TRUCK # 112 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐

24300 TW

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>AL</u>	<u>8800</u>	<u>06:39</u>	<u>8:17</u>	11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 0600 STOP TIME 0900
LUNCH TIME _____ STAND BY _____
DOWNTIME _____ TOTAL TIME 3

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

KEEP THIS FOR REFERENCE

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>RICKY FULLER</u>	DATE <u>7-24-03</u>
LOCATION <u>TTR SANDIA</u>		
CONTRACTOR <u>SHAW</u>		

TRUCK # 013 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐

EMPTY 33000

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>TPH</u>	<u>77800</u>	<u>615</u>	<u>1140</u>	11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 6 AM STOP TIME 4:30
LUNCH TIME 100-130 AM STAND BY _____
DOWNTIME _____ TOTAL TIME 10

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature [Signature]
KEEP THIS FOR REFERENCE

STONE BROTHERS CONSTRUCTION & DEMOLITION

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118

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>TOY EDDINGTON</u>	DATE <u>7-24-03</u>
LOCATION <u>TTR</u>		
CONTRACTOR <u>SHAW</u>		

TRUCK # 112 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐

24,300

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>TPH</u>	<u>70660</u>	<u>619</u>		11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 0630 STOP TIME 4:00
LUNCH TIME 12:15-12:45 STAND BY 0
DOWNTIME 0 TOTAL TIME 10

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature [Signature]
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175

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME Ben Boyd DATE 7/22/13
LOCATION Sandia TTR
CONTRACTOR Shaw

TRUCK # 205/921

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

Type 33700

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. AL 110	43	555	825	11.			
2. CF	80K	845	915	12.			
3. AL	80K	920	1000	13.			
4. CF	80K	1080	1100	14.			
5. AL	80K	1100	1150	15.			
6. CF	80K	1250	1220	16.			
7. AL	80K	1300	1220	17.			
8. AL	80K	240	310	18.			
9. AL	80K	315	410	19.			
10.				20.			

START TIME 7:00

STOP TIME 4:30

LUNCH TIME 12:15

STAND BY _____

DOWN TIME _____

TOTAL TIME _____

REMARKS: Repaired exhaust 14r Fuel @ 1078-1070

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

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111

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME Tony Eddington DATE 7-22-03
LOCATION TTR
CONTRACTOR Sandia

TRUCK # 112

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

24,300 TW

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. AL	6258	6:50	7:30	11. AL	85280	2:55	3:25
2. CF	85280	7:45	8:25	12.			
3. AL	28920	8:27	9:00	13.			
4. CF	85280	9:07	9:35	14.			
5. AL	81240	10:07	10:15	15.			
6. CF	85280	10:20	10:55	16.			
7. AL	81240	10:58	12:00	17.			
8. CF	85280	1:15	1:45	18.			
9. AL	85280	1:49	2:10	19.			
10. CF	85280	2:25	2:50	20.			

START TIME 0600

STOP TIME 4:00

LUNCH TIME 12:15-1245

STAND BY _____

DOWN TIME _____

TOTAL TIME _____

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

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206

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME STEVE BAIRD DATE 7-22-03
LOCATION TR
CONTRACTOR Shaw

TRUCK # WT # 203

SEMI END DUMP ☐

LOWBED ☐

SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. A.L.	1	0625	0635	11.			
2. A.L.	1	0726	0736	12.			
3. A.L.	1	0830	0838	13.			
4. A.L.	1	1015	1024	14.			
5. A.L.	1	1120	1130	15.			
6. A.L.	1	1305	1313	16.			
7. A.L.	1	1402	1412	17.			
8. A.L.	1	1526	1532	18.			
9.				19.			
10.				20.			

START TIME 06:00

STOP TIME 16:00

LUNCH TIME 12:00-12:30

STAND BY 0

DOWNTIME 0

TOTAL TIME 9 1/2

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

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144

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME RICKY FULLER DATE 7-22-03
LOCATION SANDIA TR
CONTRACTOR SHAW

TRUCK # Q13

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. 916500	AL	1648	725	11.			
2. 83500	CF	741	806	12.			
3. 23500	CF	831	858	13.			
4. 83500	CF	972	1000	14.			
5. 83500	CF	1032	1102	15.			
6. 96500	AL	1101	1155	16.			
7. 83500	CF	1230	1254	17.			
8. 85000	CF	120	150	18.			
9. 916500	AL	153	940	19.			
10. 916500	AL	330		20.			

START TIME 6:00

STOP TIME 16:30

LUNCH TIME 12:00-12:30

STAND BY _____

DOWNTIME _____

TOTAL TIME 10 hrs

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME Tony Edgington DATE 7-21-03
LOCATION TTR
CONTRACTOR Sandia

TRUCK # 112 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐

24,300 TW

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. AL	85280	1:50	7:45	11. AL	85280	2:58	3:40
2. CF	85280	7:55	8:25	12.			
3. AL	85280	8:27	9:12	13.			
4. CF	85280	9:20	9:45	14.			
5. AL	85280	9:50	10:30	15.			
6. CF	85280	10:40	11:05	16.			
7. AL	85280	11:40	11:55	17.			
8. CF	85280	1:15	1:40	18.			
9. AL	85280	1:42	2:25	19.			
10. CF	85280	2:33	2:55	20.			

START TIME 0600 STOP TIME 4:00
LUNCH TIME 12:15-12:45 STAND BY _____
DOWN TIME _____ TOTAL TIME 9 1/2

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME Ricky Fuller DATE 7-21-03
LOCATION SANDIA TTR
CONTRACTOR SHAW

TRUCK # _____ SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐

33000-TARE

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. 196500	AL	7:00	7:50	11. 83500	CF	3:20	3:47
2. 83500	CF	8:04	8:25	12. 96500	AL	3:50	4:26
3. 83500	CF	9:02	9:30	13.			
4. 96500	AL	9:34	10:15	14.			
5. 83500	CF	10:26	10:55	15.			
6. 96500	AL	10:58	11:35	16.			
7. 83500	CF	12:34	1:00	17.			
8. 96500	AL	1:05	1:45	18.			
9. 83500	CF	1:58	2:33	19.			
10. 96500	AL	2:25	3:05	20.			

START TIME 6 AM STOP TIME 4:30
LUNCH TIME 11:50-12:20 STAND BY _____
DOWN TIME _____ TOTAL TIME 10

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>Ben Boyd</u>	DATE <u>7/24/03</u>
LOCATION <u>Sandica Creek</u>		
CONTRACTOR <u>Shaw</u>		

TRUCK # 205

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

Tag 33,750

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>AL</u>	<u>7742</u>	<u>700</u>	<u>745</u>	11.			
2. <u>CF</u>	<u>80K</u>	<u>805</u>	<u>830</u>	12.			
3. <u>CF</u>	<u>80K</u>	<u>100</u>	<u>120</u>	13.			
4. <u>AL</u>	<u>80K</u>	<u>205</u>	<u>245</u>	14.			
5. <u>AL</u>	<u>80K</u>	<u>305</u>	<u>330</u>	15.			
6. <u>CF</u>	<u>80K</u>	<u>380</u>	<u>400</u>	16.			
7. <u>AL</u>	<u>80K</u>			17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 6:00

STOP TIME 4:00

LUNCH TIME _____

STAND BY _____

DOWN TIME _____

TOTAL TIME 10

REMARKS: By Hydrolic 830 to 1130
130 Ton Belly Dump & Try again (top of pad)

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

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143

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>STEVE BAIRD</u>	DATE <u>7-21-03</u>
LOCATION <u>TTR - A.L. / Landfill Roads</u>		
CONTRACTOR		

TRUCK # WT #203

SEMI END DUMP ☐

LOWBED ☐

SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>A.L.</u>	<u>1</u>	<u>0727</u>	<u>0740</u>	11.			
2. <u>A.L.</u>	<u>1</u>	<u>0845</u>	<u>0854</u>	12.			
3. <u>A.L.</u>	<u>1</u>	<u>1025</u>	<u>1035</u>	13.			
4. <u>A.L.</u>	<u>1</u>	<u>1145</u>	<u>1147</u>	14.			
5. <u>A.L.</u>	<u>1</u>	<u>1229</u>	<u>1238</u>	15.			
6. <u>A.L.</u>	<u>1</u>	<u>1338</u>	<u>1349</u>	16.			
7. <u>A.L.</u>	<u>1</u>	<u>1435</u>	<u>1445</u>	17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 06:00

STOP TIME 16:00

LUNCH TIME 12:00 - 12:30

STAND BY 0

DOWN TIME 0

TOTAL TIME 9 1/2

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>Ben Boyd</u>	DATE <u>7/18/03</u>
LOCATION <u>TTR</u>		
CONTRACTOR <u>Shaw Seandic 01293</u>		

TRUCK # 205

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

Tear 33,750 78/00

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>AL</u>	<u>Full</u>	<u>635</u>	<u>720</u>	11.			
2. <u>CF</u>	<u>11</u>	<u>740</u>	<u>800</u>	12.			
3. <u>AL</u>	<u>11</u>	<u>810</u>	<u>850</u>	13.			
4. <u>CF</u>	<u>11</u>	<u>915</u>	<u>940</u>	14.			
5. <u>AL</u>	<u>11</u>	<u>945</u>	<u>1025</u>	15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 6 AM

STOP TIME 1100

LUNCH TIME _____

STAND BY _____

DOWN TIME _____

TOTAL TIME 5 (5)

REMARKS: AL @ 630

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>R Fuller</u>	DATE <u>7-18-03</u>
LOCATION <u>AL TTR</u>		
CONTRACTOR <u>SANDIA</u>		

TRUCK # 213

SEMI END DUMP ☒

LOWBED ☐

SEMI BELLY DUMP ☐

E14PTX 33000

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>96500</u>	<u>AL</u>	<u>635</u>	<u>720</u>	11.			
2. <u>83500</u>	<u>CF</u>	<u>915</u>	<u>950</u>	12.			
3. <u>96500</u>	<u>AL</u>	<u>955</u>	<u>1035</u>	13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 6 AM

STOP TIME 1100

LUNCH TIME _____

STAND BY _____

DOWN TIME 720-912

TOTAL TIME 5

REMARKS: BROKEN HYDROLIC HOSE

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature [Signature]

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204

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>STEVE BAIRD</u>	DATE <u>7-18-03</u>
LOCATION <u>TTR - Antelope LAKE</u>		
CONTRACTOR		

TRUCK # WT # 203

LOWBED ☐

SEMI END DUMP ☐

SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1.				11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 06:00

STOP TIME 08:00

LUNCH TIME _____

STAND BY _____

DOWNTIME 2.0 hrs

TOTAL TIME 2.0

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature
KEEP THIS FOR REFERENCE

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109

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>Tony Eddington</u>	DATE <u>7-18-03</u>
LOCATION <u>TTR</u>		
CONTRACTOR <u>Sandia</u>		

TRUCK # 112

LOWBED ☐

SEMI END DUMP ☒

SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>AL</u>	<u>89.640</u>	<u>6:25</u>	<u>7:18</u>	11.			
2. <u>CT</u>	<u>78.780</u>	<u>7:30</u>	<u>7:52</u>	12.			
3. <u>AL</u>	<u>85.680</u>	<u>7:52</u>	<u>8:57</u>	13.			
4. <u>CF</u>	<u>78.780</u>	<u>8:49</u>	<u>9:22</u>	14.			
5. <u>AL</u>	<u>89.640</u>	<u>9:13</u>	<u>9:57</u>	15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 0600

STOP TIME 11:00

LUNCH TIME

STAND BY

DOWNTIME

TOTAL TIME 5

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>STEVE BAIRD</u>	DATE <u>7-17-03</u>
LOCATION <u>TTR - Antelope Lake</u>		
CONTRACTOR		

TRUCK # WT 203
LOWBED ☐

SEMI END DUMP ☐
SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. AL	1	0623	0635	11.			
2. AL	1	0745	0757	12.			
3. AL	1	0840	0852	13.			
4. AL	1	1002	1013	14.			
5. AL	1	1111	1123	15.			
6. AL	1	1227	1239	16.			
7. AL	1	1336	1347	17.			
8. AL	1	1445	1456	18.			
9.				19.			
10.				20.			

START TIME 0600
LUNCH TIME 11:30 - 12:00
DOWNTIME 1.5

STOP TIME 4:00
STAND BY 0
TOTAL TIME 9 1/2

REMARKS: In + Out times are at the well filling up.

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO	DRIVER'S NAME <u>Tony Eddington</u>	DATE <u>7-17-03</u>
LOCATION <u>TTR</u>		
CONTRACTOR <u>Sandic</u>		

TRUCK # 112
LOWBED ☐

SEMI END DUMP ☒
SEMI BELLY DUMP ☐

24,680 - TARE WT.

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. AL	86,140	6:40	7:40	11. AL	89,640	2:50	3:13
2. CF	78,780	7:50	8:13	12.			
3. AL	86,140	8:15	8:54	13.			
4. CF	78,780	9:19	9:31	14.			
5. AL	89,640	9:33	10:35	15.			
6. CF	78,780	10:45	11:13	16.			
7. AL	89,640	11:15	12:00	17.			
8. CF	78,780	12:57	1:19	18.			
9. AL	89,640	1:21	2:10	19.			
10. CF	78,780	2:20	2:50	20.			

START TIME 0600
LUNCH TIME 12:15 - 12:45
DOWNTIME

STOP TIME 4:00
STAND BY
TOTAL TIME 9 1/2

REMARKS:

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature

[Signature]

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140

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME RICKY FULLER DATE 7/17-03
LOCATION AL M TIR
CONTRACTOR SANDIA

TRUCK # 213 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐
EMPTY 33000

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. 96500	AL	1058	815	11.			
2. 93500	CF	0700	930	12.			
3. 96500	AL	935	1015	13.			
4. 93500	CF	1035	1105	14.			
5. 96500	AL	1107	1155	15.			
6. 93500	CF	1240	110	16.			
7. 96500	AL	115	700	17.			
8. 93500	CF	370	240	18.			
9. 96500	AL	246	345	19.			
10.				20.			

START TIME 10 AM STOP TIME 4:00
LUNCH TIME 1210 = 1235 STAND BY _____
DOWNTIME _____ TOTAL TIME 10 9 1/2

REMARKS: 10

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

KEEP THIS FOR REFERENCE

STONE BROTHERS CONSTRUCTION & DEMOLITION

P.O. Box 3010
Tonopah, NV 89049
775-482-2015 • Fax 775-482-2018

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME Ben Boyd DATE 7/17/03
LOCATION TIR
CONTRACTOR Shaw

TRUCK # 205 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐
78,600 Tare 33750

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. AL	8000 700	815		11.			
2. CF	"	840	800	12.			
3. AL	"	915	950	13.			
4. CF	"	1035	1000	14.			
5. AL	"	1100	1135	15.			
6. CF	"	1245	115	16.			
7. AL	"	130	210	17.			
8. CF	"	230	250	18.			
9. AL	"	300	315	19.			
10.				20.			

START TIME 6 AM STOP TIME 4 PM
LUNCH TIME 12 15 STAND BY _____
DOWNTIME _____ TOTAL TIME 9 1/2

REMARKS: Trigate Take 0630
changes 740/800 950 (resting) 540/600

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature _____

KEEP THIS FOR REFERENCE

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME RICKY FULLER DATE 7/16/03
LOCATION A3 TTR
CONTRACTOR SANDIA

TRUCK # 213 SEMI END DUMP ☒
LOWBED ☐ EMPTY = 3000
LOAD UNLOAD

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. 991000	A3	645	910	11. 83500	CF	1300	310
2. 90240	A3	935	915	12. 83500	CF	1300	340
3. 90300	A3	945	1005	13.			
4. 83500	CF	1045	1100	14.			
5. 83500	CF	1106	1130	15.			
6. 83500	CF	1245	1240	16.			
7. 83500	CF	1245	1255	17.			
8. 83500	CF	1102	1112	18.			
9. 83500	CF	148	920	19.			
10. 83500	CF	240	352	20.			

START TIME 6 AM STOP TIME 400
LUNCH TIME 1145-1220 STAND BY _____
DOWNTIME _____ TOTAL TIME 9 1/2

REMARKS: TAKES TIME TO TARP HAP
TO RUN IN CONVOY

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature Mike Doherty
KEEP THIS FOR REFERENCE

STONE BROTHERS CONSTRUCTION & DEMOLITION

P.O. Box 3010
Tonopah, NV 89049
775-482-2015 • Fax 775-482-2018

171

END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME Don Boyd DATE 7/16/03
LOCATION TTR
CONTRACTOR Shaw

TRUCK # 205 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>A3</u>	<u>77650</u>	<u>725</u>	<u>915</u>	11.			
2. <u>A3</u>	<u>87220</u>	<u>820</u>	<u>990</u>	12.			
3. <u>A3</u>	<u>80K+</u>	<u>935</u>	<u>1015</u>	13.			
4. <u>A3</u>	<u>78K</u>	<u>1030</u>	<u>1110</u>	14.			
5. <u>CF</u>	<u>76320</u>	<u>1130</u>	<u>1210</u>	15.			
6. <u>CF</u>	<u>804K</u>	<u>1250</u>	<u>105</u>	16.			
7. <u>CF</u>	<u>804K</u>	<u>115</u>	<u>125</u>	17.			
8. <u>NE</u>	<u>804K</u>	<u>200</u>	<u>225</u>	18.			
9. <u>CF</u>	<u>80+</u>	<u>240</u>	<u>300</u>	19.			
10. <u>CF</u>	<u>80+</u>	<u>310</u>	<u>330</u>	20.			

START TIME 6 AM STOP TIME 4 PM
LUNCH TIME 1210-1240 STAND BY _____
DOWNTIME _____ TOTAL TIME 10 1/2 9 1/2

REMARKS: TTR 6 AM
Teawate 33,750

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature Mike Doherty
KEEP THIS FOR REFERENCE

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME Tony Eddington DATE 7-16-03
LOCATION _____
CONTRACTOR _____

TRUCK # 112 SEMI END DUMP ☒
LOWBED ☐ SEMI BELLY DUMP ☐

Entry 24,300

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>AB</u>	<u>90,740</u>	<u>7:03</u>	<u>8:15</u>	11. <u>C.F</u>	<u>78780</u>	<u>3:30</u>	<u>3:51</u>
2. <u>A3</u>	<u>77,980</u>	<u>8:30</u>	<u>9:19</u>	12.			
3. <u>A3</u>	<u>77,980</u>	<u>9:33</u>	<u>10:19</u>	13.			
4. <u>A3</u>	<u>77,980</u>	<u>10:25</u>	<u>10:59</u>	14.			
5. <u>CF</u>	<u>78,780</u>	<u>11:15</u>	<u>12:00</u>	15.			
6. <u>CF</u>	<u>78,780</u>	<u>12:31</u>	<u>12:53</u>	16.			
7. <u>CF</u>	<u>78,780</u>	<u>12:58</u>	<u>1:15</u>	17.			
8. <u>CF</u>	<u>78,780</u>	<u>1:26</u>	<u>2:20</u>	18.			
9. <u>CF</u>	<u>78,780</u>	<u>2:27</u>	<u>2:51</u>	19.			
10. <u>CF</u>	<u>78,780</u>	<u>2:59</u>	<u>3:11</u>	20.			

START TIME 06:00 STOP TIME 4:00
LUNCH TIME 11:48-12:20 STAND BY _____
DOWNTIME _____ TOTAL TIME 9 1/2

REMARKS: _____

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature Mike Debra
KEEP THIS FOR REFERENCE

STONE BROTHERS CONSTRUCTION & DEMOLITION

P.O. Box 3010
Tonopah, NV 89049
775-482-2015 • Fax 775-482-2018

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END DUMPS • LOWBED • BELLY DUMP • FLATBED

P.O. NO. _____ DRIVER'S NAME STEVE BAIRD DATE 7-16-03
LOCATION Area 3 / WATER TANK
CONTRACTOR _____

TRUCK # Water Truck #203 SEMI END DUMP ☐
LOWBED ☐ SEMI BELLY DUMP ☐

TICKET #	QUANTITY	IN	OUT	TICKET #	QUANTITY	IN	OUT
1. <u>A-3</u>	<u>1</u>	<u>0645</u>	<u>0700</u>	11.			
2. <u>A-3</u>	<u>1</u>	<u>0847</u>	<u>0903</u>	12.			
3. <u>A-3</u>	<u>1</u>	<u>1016</u>	<u>1027</u>	13.			
4. <u>A-3</u>	<u>1</u>	<u>1210</u>	<u>1223</u>	14.			
5. <u>A-3</u>	<u>1</u>	<u>1325</u>	<u>1337</u>	15.			
6. <u>A-3</u>	<u>1</u>	<u>1447</u>	<u>1500</u>	16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

START TIME 06:00 STOP TIME 16:00
LUNCH TIME 11:40-12:10 STAND BY 0
DOWNTIME 0 TOTAL TIME 9.5

REMARKS: In + Out time is time spent filling Water Truck

Terms: net due on the 15th of the month following statement date. Past due amounts will be assessed at 1-1/2% (one and one half percent) finance charge per month for accounts over thirty days.

Supervisors Signature Mike Debra
KEEP THIS FOR REFERENCE

**Sandia National Laboratories
Tonopah Test Range**

Declaration of Non-Hazardous/Non-Radiological Waste

Sandia National Laboratories hereby certifies that the solid waste described below is not a "hazardous waste", as that term is defined in 40 CFR Subpart C. Sandia National Laboratories further certifies that the materials are non-radiological in nature and meet D.O.E. radiological control criteria for release to the general public. This certification is the result of actual testing, surveying, and/or knowledge of the characteristics of the waste based on the materials or processes and/or locations used.

Description of Waste (Check & complete appropriate Item(s)):

1. ☐ Office Refuse	USAF Sanitary Landfill	Weight of Load: _____
2. ☒ Construction Debris	Peot Debris Landfill	Weight of Load: <u>6560</u>

Description of Load: Scrap Metal

Method of Waste Characterization

☐ Generator Knowledge ☒ Analytical ☐ Screening Survey ☒ Radiological Survey

Certified BY:

<u>Dawn Arnold</u> Printed Name	<u>Dawn Arnold</u> Signature
<u>SPAW/SAIC</u> Company	<u>Site Supervisor</u> Title
<u>05/14/03</u> Date	

SWO USE (Circle One Area) AREA**23** **9****LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Brian KonradPhone Number: 5-1240Location / Origin: CAU 410 Tonopah Test Range

Waste Category: (check one)

☒ Commercial egs☒ Industrial egs 3/5/03Waste Type:
(check one)☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ Contents

Prohibited Waste

at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste
at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☐ Rocks / unaltered geologic materials☒ Empty containers☐ Asphalt☐ Metal☐ Wood☒ Soil Hydro☐ Rubber (excluding tires)☐ Demolition debris☐ Plastic☐ Wire☐ Cable☐ Cloth egs☐ Insulation (non-Asbestosform)☐ Cement & concrete☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste☐ Food Waste☐ Animal Carcasses☐ Asbestos:☐ Friable☐ Non-Friable (contact SWO if regulated load)

Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☐ Drained fuel filters (gas & diesel)☐ Crushed non-terme plated oil filters☐ Plants☐ Sludge from sand/oil/water separators☐ PCBs below 50 parts per million**REQUIRED: WASTE GENERATOR SIGNATURE**

Initials: _____ (If Initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only the site. I have verified this through the waste characterization method identif. prohibited and allowable waste items.

Print Name: Allen Allshouse

Signature: _____

Date: 3/4/03**Radiation Survey Release for Waste Disposal****RCT Initials**☐ This container/load is free of external radioactive contamination.☐ This container/load is exempt from survey due to process knowledge and origin.☒ This container/load is free of radioactive contamination based on radioanalysis.

SIGNATURE: _____

DATE: 3-4-03

BN-0918 (09/00)

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLYLoad Weight (net from scale or estimate): 35120

Signature of Certifier: _____

SWO USE (Circle One Area) AREA

23

X

9

LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Brian Konrad

Phone Number: 5-1240

Location / Origin: CAU 410 Tonopah Test Range

Waste Category: (check one)

☒ Commercial MS

☒ Industrial MS 3/5/03

Waste Type:
(check one)

☐ NTS

☐ Putrescible

☐ FFACO-onsite

☐ WAC Exception

☐ Non-Putrescible

☐ Asbestos Containing Material

☒ FFACO-offsite

☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management

☐ Defense Projects

Pollution Prevention Category: (check one)

☒ Clean-Up

☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis

☐ Process Knowledge

☐ Contents

Prohibited Waste
at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste
at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper

☐ Rocks / unaltered geologic materials

☒ Empty containers

☐ Asphalt

☐ Metal

☐ Wood

☒ Soil Hydms

☐ Rubber (excluding tires)

☐ Demolition debris

☐ Plastic

☐ Wire

☐ Cable

☐ Cloth MS

☐ Insulation (non-Asbestosform)

☐ Cement & concrete

☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste

☐ Food Waste

☐ Animal Carcasses

☐ Asbestos: ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos

☐ Drained automobiles and military vehicles

☐ Solid fractions from sand/oil/water separators

☐ Light ballasts (contact SWO)

☐ Drained fuel filters (gas & diesel)

☐ Deconned Underground and Above Ground

☐ Hydrocarbons (contact SWO)

☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge

☐ Rags

☐ Drained fuel filters (gas & diesel)

☐ Crushed non-terne plated oil filters

☐ Plants

☐ Sludge from sand/oil/water separators

☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: _____ (If Initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only the site. I have verified this through the waste characterization method identifying prohibited and allowable waste items.

Print Name: Allen Allshouse

Signature: _____

Date: 3/4/03

Radiation Survey Release for Waste Disposal

RCT Initials

☐ This container/load is free of external radioactive contamination.

☐ This container/load is exempt from survey due to process knowledge and origin.

☒ This container/load is free of radioactive contamination based on radioanalysis.

SIGNATURE: _____

DATE: 3-4-03

BN-0546 (09/99)

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 34,780

Signature of Certifier: Rob Rish

NTS Landfill Load Verification

(Waste definitions are available on page 2)

SWO USE (Circle One Area) AREA

23

9

LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Brian Konrad

Phone Number: 5-1240

Location / Origin: CAU 410 Tonopah Test Range

Waste Category: (check one)

☒ Commercial MS

☒ Industrial MS 3/5/03

Waste Type:
(check one)

☐ NTS

☐ Putrescible

☐ FFACO-onsite

☐ WAC Exception

☐ Non-Putrescible

☐ Asbestos Containing Material

☒ FFACO-offsite

☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management

☐ Defense Projects

Pollution Prevention Category: (check one)

☒ Clean-Up

☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis

☐ Process Knowledge

☐ Contents

Prohibited Waste
at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste
at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper

☐ Rocks / unaltered geologic materials

☒ Empty containers

☐ Asphalt

☐ Metal

☐ Wood

☒ Soil Hydro

☐ Rubber (excluding tires)

☐ Demolition debris

☐ Plastic

☐ Wire

☐ Cable

☐ Cloth MS

☐ Insulation (non-Asbestosform)

☐ Cement & concrete

☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste

☐ Food Waste

☐ Animal Carcasses

☐ Asbestos:

☐ Friable

☐ Non-Friable (contact SWO if regulated load)

Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos

☐ Drained automobiles and military vehicles

☐ Solid fractions from sand/oil/water separators

☐ Light ballasts (contact SWO)

☐ Drained fuel filters (gas & diesel)

☐ Deconned Underground and Above Ground

☐ Hydrocarbons (contact SWO)

☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge

☐ Rags

☐ Drained fuel filters (gas & diesel)

☐ Crushed non-terne plated oil filters

☐ Plants

☐ Sludge from sand/oil/water separators

☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: _____ (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only the site. I have verified this through the waste characterization method identifying prohibited and allowable waste items.

Print Name: Allen Allishouse

Signature: _____

Date: 3-4-03

Radiation Survey Release for Waste Disposal

RCT Initials

☐ This container/load is free of external radioactive contamination.

☐ This container/load is exempt from survey due to process knowledge and origin.

☒ This container/load is free of radioactive contamination based on radioanalysis.

SIGNATURE: _____

DATE: 3-4-03

BN-0846 (09/99)

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 25,660

Signature of Certifier: _____

SWO USE (Circle One Area) AREA

23

X

9

LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Brian Konrad

Phone Number: 5-1240

Location / Origin: CAU 410 Tonopah Test Range

Waste Category: (check one)

☒ Commercial CGS

☐ Industrial CGS 3/5/03

Waste Type:
(check one)

☐ NTS

☐ Putrescible

☐ FFACO-onsite

☐ WAC Exception

☐ Non-Putrescible

☐ Asbestos Containing Material

☒ FFACO-offsite

☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management

☐ Defense Projects

Pollution Prevention Category: (check one)

☒ Clean-Up

☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis

☐ Process Knowledge

☐ Contents

Prohibited Waste
at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste
at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper

☐ Rocks / unaltered geologic materials

☒ Empty containers

☐ Asphalt

☐ Metal

☐ Wood

☒ Soil Hydro

☐ Rubber (excluding tires)

☐ Demolition debris

☐ Plastic

☐ Wire

☐ Cable

☐ Cloth

☐ Insulation (non-Asbestosform)

☐ Cement & concrete

☐ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste

☐ Food Waste

☐ Animal Carcasses

☐ Asbestos: ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos

☐ Drained automobiles and military vehicles

☐ Solid fractions from sand/oil/water separators

☐ Light ballasts (contact SWO)

☐ Drained fuel filters (gas & diesel)

☐ Deconned Underground and Above Ground

☐ Hydrocarbons (contact SWO)

☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge

☐ Rags

☐ Drained fuel filters (gas & diesel)

☐ Crushed non-terme plated oil filters

☐ Plants

☐ Sludge from sand/oil/water separators

☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: _____ (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only the site. I have verified this through the waste characterization method identif. prohibited and allowable waste items.

Print Name: Allen Allshouse

Signature: _____ Date: 3/4/03

Radiation Survey Release for Waste Disposal

RCT Initials

☐ This container/load is free of external radioactive contamination.

☐ This container/load is exempt from survey due to process knowledge and origin.

☒ This container/load is free of radioactive contamination based on radioanalysis.

SIGNATURE: _____ DATE: 3/4/03
BN-0040 (09/00)

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 30460

Signature of Certifier: Al Mal

SWO USE (Circle One Area) AREA**23****6****9****LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of EnergyPhone Number: 702 295-3357Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial☒ Industrial

Waste Type:

☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception

(check one)

☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ Contents

Prohibited Waste

at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste
at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☒ Rocks / unaltered geologic materials☐ Empty containers☐ Asphalt☒ Metal☒ Wood☒ Soil☐ Rubber (excluding tires)☐ Demolition debris☒ Plastic☒ Wire☐ Cable☐ Cloth☐ Insulation (non-Asbestosform)☒ Cement & concrete☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste☐ Food Waste☐ Animal Carcasses☐ Asbestos:☐ Friable☐ Non-Friable (contact SWO if regulated load)

Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Other _____☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☒ Drained fuel filters (gas & diesel)☐ Crushed non-terne plated oil filters☐ Plants☒ Soil☐ Sludge from sand/oil/water separators☐ PCBs below 50 parts per million**REQUIRED: WASTE GENERATOR SIGNATURE**Initials: JMZ (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. FowlerSignature: John M. Fowler Date: 07/22/03If applicable, place BN-0646,
"Radiological Release Sticker"
here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLYLoad Weight (net from scale or estimate): 78160Signature of Certifier: R. Feller33000 ENW 8.0

BFI-0018 (04/03)

45160 Load Weight

SWO USE (Circle One Area) AREA**23****6****9****LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of EnergyPhone Number: 702 295-3357Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial☒ Industrial

Waste Type:

☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception

(check one)

☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ Contents

Prohibited Waste

at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos
at the Area 9 U10c Landfill:**REQUIRED: WASTE CONTENTS ALLOWABLE WASTES**

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☒ Rocks / unaltered geologic materials☐ Empty containers☐ Asphalt☒ Metal☒ Wood☒ Soil☐ Rubber (excluding tires)☐ Demolition debris☒ Plastic☒ Wire☐ Cable☐ Cloth☐ Insulation (non-Asbestosform)☒ Cement & concrete☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste☐ Food Waste☐ Animal Carcasses☐ Asbestos:☐ Friable☐ Non-Friable

(contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Other _____☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☒ Drained fuel filters (gas & diesel)☐ Crushed non-terne plated oil filters☐ Plants☒ Soil☐ Sludge from sand/oil/water separators☐ PCBs below 50 parts per million**REQUIRED: WASTE GENERATOR SIGNATURE**Initials: JMF (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. FowlerSignature: John M. FowlerDate: 07/22/03If applicable, place BN-0646,
"Radiological Release Sticker"
here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate):

73,160Signature of Certifier: Tony [Signature]

Revision Code: ENV 8.b

BN-0618 (04/03)

23,930 HW50,260

LOAD WEIGHT

SWO USE (Circle One Area) AREA**23****6****9****LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of EnergyPhone Number: 702 295-3357Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial☒ IndustrialWaste Type:
(check one)☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ Contents

Prohibited Waste

at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste

at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☒ Rocks / unaltered geologic materials☐ Empty containers☐ Asphalt☒ Metal☒ Wood☒ Soil☐ Rubber (excluding tires)☐ Demolition debris☒ Plastic☒ Wire☐ Cable☐ Cloth☐ Insulation (non-Asbestosform)☒ Cement & concrete☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste☐ Food Waste☐ Animal Carcasses☐ Asbestos:☐ Friable☐ Non-Friable (contact SWO if regulated load)

Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Other _____☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☒ Drained fuel filters (gas & diesel)☐ Other _____☐ Plants☒ Soil☐ Sludge from sand/oil/water separators☐ Crushed non-terne plated oil filters☐ PCBs below 50 parts per million**REQUIRED: WASTE GENERATOR SIGNATURE**Initials: JMF (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. FowlerSignature: John M. FowlerDate: 07/22/03If applicable, place BN-0646,
"Radiological Release Sticker"
here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLYLoad Weight (net from scale or estimate): 45,700Signature of Certifier: [Signature]

SWO USE (Circle One Area) AREA

23

6

9

LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of Energy

Phone Number: 702 295-3357

Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial☒ IndustrialWaste Type:
(check one)☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ ContentsProhibited Waste
at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos at the Area 9 U10c Landfill:

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☒ Rocks / unaltered geologic materials☐ Empty containers☐ Asphalt☒ Metal☒ Wood☒ Soil☐ Rubber (excluding tires)☐ Demolition debris☒ Plastic☒ Wire☐ Cable☐ Cloth☐ Insulation (non-Asbestosform)☒ Cement & concrete☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office waste ☐ Food Waste ☐ Animal Carcasses☐ Asbestos: ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Other _____☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☒ Drained fuel filters (gas & diesel)☐ Other _____☐ Plants☒ Soil☐ Sludge from sand/oil/water separators☐ Crushed non-terne plated oil filters☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: JMF (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. Fowler

Signature: John M. FowlerDate: 07/22/03If applicable, place BN-0646,
"Radiological Release Sticker"
here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 44800Signature of Certifier: R. Faller

SWO USE (Circle One Area) AREA

23

6

9

LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of Energy

Phone Number: 702 295-3357

Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial☒ IndustrialWaste Type:
(check one)☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ ContentsProhibited Waste
at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste
at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-; Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☒ Rocks / unaltered geologic materials☐ Empty containers☐ Asphalt☒ Metal☒ Wood☒ Soil☐ Rubber (excluding tires)☐ Demolition debris☒ Plastic☒ Wire☐ Cable☐ Cloth☐ Insulation (non-Asbestos-form)☒ Cement & concrete☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste☐ Food Waste☐ Animal Carcasses☐ Asbestos:☐ Friable☐ Non-Friable (contact SWO if regulated load)

Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Other _____☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☒ Drained fuel filters (gas & diesel)☐ Other _____☐ Plants☒ Soil☐ Sludge from sand/oil/water separators☐ Crushed non-terne plated oil filters☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: JMF

(If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. Fowler

Signature: John M. Fowler

Date: 07/22/03

If applicable, place BN-0646,
"Radiological Release Sticker"
here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 70.660

Signature of Certifier: Tony Golding

Retention Code: ENV 8.b

BN-0618 (04/03)

24.350 TW

54.360

7/29/03

SWO USE (Circle One Area) AREA**23****6****9****LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of EnergyPhone Number: 702 295-3357Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial☒ Industrial

Waste Type:

☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception

(check one)

☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ Contents

Prohibited Waste

at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste

at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☒ Rocks / unaltered geologic materials☐ Empty containers☐ Asphalt☒ Metal☒ Wood☒ Soil☐ Rubber (excluding tires)☐ Demolition debris☒ Plastic☒ Wire☐ Cable☐ Cloth☐ Insulation (non-Asbestosform)☒ Cement & concrete☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste☐ Food Waste☐ Animal Carcasses☐ Asbestos:☐ Friable☐ Non-Friable (contact SWO if regulated load)

Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Other _____☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☒ Drained fuel filters (gas & diesel)☐ Crushed non-terne plated oil filters☐ Plants☒ Soil☐ Sludge from sand/oil/water separators☐ PCBs below 50 parts per million**REQUIRED: WASTE GENERATOR SIGNATURE**Initials: JMF (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. FowlerSignature: John M. FowlerDate: 07/22/03If applicable, place BN-0646,
"Radiological Release Sticker"
here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLYLoad Weight (net from scale or estimate): 79340Signature of Certifier: R. J. [Signature]

— # 2

Bechtel Nevada

NTS Landfill Load Verification

(Waste definitions are available on page 2)

SWO USE (Circle One Area) AREA 23 6 9 LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of Energy Phone Number: 702 295-3357

Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)	☐ Commercial	☒ Industrial		
Waste Type: (check one)	☐ NTS	☐ Putrescible	☐ FFACO-onsite	☐ WAC Excaption
	☐ Non-Putrescible	☐ Asbestos Containing Material	☒ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one)	☒ Environmental management	☐ Defense Projects	☐ YMP	
Pollution Prevention Category: (check one)	☒ Clean-Up	☐ Routine		
Method of Characterization: (check one)	☒ Sampling & Analysis	☐ Process Knowledge	☐ Contents	

Prohibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste at the Area 9 U10c Landfill: Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:	☐ Paper	☒ Rocks / unaltered geologic materials	☐ Empty containers		
☐ Asphalt	☒ Metal	☒ Wood	☒ Soil	☐ Rubber (excluding tires)	☐ Demolition debris
☒ Plastic	☒ Wire	☐ Cable	☐ Cloth	☐ Insulation (non-Asbestosform)	☒ Cement & concrete
☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)					

Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office waste ☐ Food Waste ☐ Animal Carcasses

☐ Asbestos: ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos	☐ Drained automobiles and military vehicles	☐ Solid fractions from sand/oil/water separators
☐ Light ballasts (contact SWO)	☐ Drained fuel filters (gas & diesel)	☐ Deconned Underground and Above Ground
☐ Hydrocarbons (contact SWO)	☐ Other _____	☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge	☐ Rags	☒ Drained fuel filters (gas & diesel)	☐ Other _____
☐ Plants	☒ Soil	☐ Sludge from sand/oil/water separators	☐ Crushed non-terne plated oil filters
			☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: JMF (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. Fowler
Signature: John M. Fowler Date: 07/22/03

If applicable, place BN-0646, "Radiological Release Sticker" here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 80,650 Signature of Certifier: Tony E. [Signature]

Retention Code: ENV 8.0

BN-0918 (04/03)

24,300 TW - 64,340 wet load weight

SWO USE (Circle One Area) AREA**23****6****9****LANDFILL**

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of EnergyPhone Number: 702 295-3357Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial☒ Industrial

Waste Type:

☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception

(check one)

☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ Contents

Prohibited Waste

at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste
at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☒ Rocks / unaltered geologic materials☐ Empty containers☐ Asphalt☒ Metal☒ Wood☒ Soil☐ Rubber (excluding tires)☐ Demolition debris☒ Plastic☒ Wire☐ Cable☐ Cloth☐ Insulation (non-Asbestosform)☒ Cement & concrete☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste☐ Food Waste☐ Animal Carcasses☐ Asbestos:☐ Friable☐ Non-Friable (contact SWO if regulated load)

Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Other _____☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☒ Drained fuel filters (gas & diesel)☐ Crushed non-terne plated oil filters☐ Plants☒ Soil☐ Sludge from sand/oil/water separators☐ PCBs below 50 parts per million**REQUIRED: WASTE GENERATOR SIGNATURE**Initials: JMF (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. FowlerSignature: John M. FowlerDate: 07/22/03If applicable, place BN-0646,
"Radiological Release Sticker"
here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLYLoad Weight (net from scale or estimate): 45,360Signature of Certifier: [Signature]

SWO USE (Circle One Area) AREA

23

6

9

LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of Energy

Phone Number: 702 295-3357

Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial

☒ Industrial

Waste Type:

☐ NTS

☐ Putrescible

☐ FFACO-onsite

☐ WAC Exception

(check one)

☐ Non-Putrescible

☐ Asbestos Containing Material

☒ FFACO-offsite

☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management

☐ Defense Projects

☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up

☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis

☐ Process Knowledge

☐ Contents

Prohibited Waste

at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste

at the Area 9 U10c Landfill: Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper

☒ Rocks / unaltered geologic materials

☐ Empty containers

☐ Asphalt

☒ Metal

☒ Wood

☒ Soil

☐ Rubber (excluding tires)

☐ Demolition debris

☒ Plastic

☒ Wire

☐ Cable

☐ Cloth

☐ Insulation (non-Asbestosform)

☒ Cement & concrete

☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste

☐ Food Waste

☐ Animal Carcasses

☐ Asbestos:

☐ Friable

☐ Non-Friable

(contact SWO if regulated load) Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos

☐ Drained automobiles and military vehicles

☐ Solid fractions from sand/oil/water separators

☐ Light ballasts (contact SWO)

☐ Drained fuel filters (gas & diesel)

☐ Deconned Underground and Above Ground

☐ Hydrocarbons (contact SWO)

☐ Other _____

☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge

☐ Rags

☒ Drained fuel filters (gas & diesel)

☐ Other _____

☐ Plants

☒ Soil

☐ Sludge from sand/oil/water separators

☐ Crushed non-terne plated oil filters

☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: JMZ

(If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. Fowler

Signature: John M. Fowler

Date: 07/22/03

If applicable, place BN-0646, "Radiological Release Sticker" here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 80.00

Signature of Certifier: [Signature]

24,300 TW - 64,300 Net

SWO USE (Circle One Area) AREA 23 6 9 LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rollofs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of Energy

Phone Number: 702 295-3357

Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial

☒ Industrial

Waste Type:

☐ NTS

☐ Putrescible

☐ FFACO-onsite

☐ WAC Exception

(check one)

☐ Non-Putrescible

☐ Asbestos Containing Material

☒ FFACO-offsite

☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management

☐ Defense Projects

☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up

☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis

☐ Process Knowledge

☐ Contents

Prohibited Waste

at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste

at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper

☒ Rocks / unaltered geologic materials

☐ Empty containers

☐ Asphalt

☒ Metal

☒ Wood

☒ Soil

☐ Rubber (excluding tires)

☐ Demolition debris

☒ Plastic

☒ Wire

☐ Cable

☐ Cloth

☐ Insulation (non-Asbestosform)

☒ Cement & concrete

☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste

☐ Food Waste

☐ Animal Carcasses

☐ Asbestos:

☐ Friable

☐ Non-Friable (contact SWO if regulated load)

Quantity: _____

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos

☐ Drained automobiles and military vehicles

☐ Solid fractions from sand/oil/water separators

☐ Light ballasts (contact SWO)

☐ Drained fuel filters (gas & diesel)

☐ Deconned Underground and Above Ground

☐ Hydrocarbons (contact SWO)

☐ Other _____

☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge

☐ Rags

☒ Drained fuel filters (gas & diesel)

☐ Other _____

☐ Plants

☒ Soil

☐ Sludge from sand/oil/water separators

☐ Crushed non-terne plated oil filters

☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: JMF

(If Initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. Fowler

Signature: John M. Fowler

Date: 07/22/03

If applicable, place BN-0646, "Radiological Release Sticker" here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 46,300

Signature of Certifier: [Signature]

SWO USE (Circle One Area) AREA

23

6

9

LANDFILL

For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.

REQUIRED: WASTE GENERATOR INFORMATION

(This form is for rolloffs, dump trucks, and other onsite disposal of materials.)

Waste Generator: Shaw Environmental, Inc. for U. S. Department of Energy

Phone Number: 702 295-3357

Location / Origin: TTR Area 3 / CAU 410

Waste Category: (check one)

☐ Commercial☒ IndustrialWaste Type:
(check one)☐ NTS☐ Putrescible☐ FFACO-onsite☐ WAC Exception☐ Non-Putrescible☐ Asbestos Containing Material☒ FFACO-offsite☐ Historic DOE/NV

Pollution Prevention Category: (check one)

☒ Environmental management☐ Defense Projects☐ YMP

Pollution Prevention Category: (check one)

☒ Clean-Up☐ Routine

Method of Characterization: (check one)

☒ Sampling & Analysis☐ Process Knowledge☐ Contents

Prohibited Waste

at all three NTS landfills:

Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels-, and Medical wastes (needles, sharps, bloody clothing).

Additional Prohibited Waste

at the Area 9 U10c Landfill:

Sewage Sludge; Animal carcasses-, Wet garbage (food waste); and Friable asbestos

REQUIRED: WASTE CONTENTS ALLOWABLE WASTES

Check all allowable wastes that are contained within this load:

NOTE: Waste disposed at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol.

Acceptable waste at any NTS landfill:

☐ Paper☒ Rocks / unaltered geologic materials☐ Empty containers☐ Asphalt☒ Metal☒ Wood☒ Soil☐ Rubber (excluding tires)☐ Demolition debris☒ Plastic☒ Wire☐ Cable☐ Cloth☐ Insulation (non-Asbestosform)☒ Cement & concrete☒ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)

Additional waste accepted at the Area 23 Mercury Landfill:

☐ Office waste☐ Food Waste☐ Animal Carcasses☐ Asbestos:☐ Friable☐ Non-Friable (contact SWO if regulated load)

Quantity:

Additional waste accepted at the Area 9 U10c Landfill:

☐ Non-friable asbestos☐ Drained automobiles and military vehicles☐ Solid fractions from sand/oil/water separators☐ Light ballasts (contact SWO)☐ Drained fuel filters (gas & diesel)☐ Deconned Underground and Above Ground☐ Hydrocarbons (contact SWO)☐ Other☐ Tanks

Additional waste accepted at the Area 6 Hydrocarbon Landfill:

☐ Septic sludge☐ Rags☒ Drained fuel filters (gas & diesel)☐ Other☐ Plants☒ Soil☐ Sludge from sand/oil/water separators☐ Crushed non-terne plated oil filters☐ PCBs below 50 parts per million

REQUIRED: WASTE GENERATOR SIGNATURE

Initials: JMZ (If initialed, no radiological clearance is necessary.)

The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials.

To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items.

Print Name: John M. Fowler

Signature: John M. FowlerDate: 07/22/03If applicable, place BN-0646,
"Radiological Release Sticker"
here. Onsite use only.

Note: Food waste, office trash and/or animal carcasses are considered not to contain added radioactivity, and therefore do not require a radiological clearance.

SWO USE ONLY

Load Weight (net from scale or estimate): 47000Signature of Certifier: JMZ

HAZTRAK ENTRY CONFIRMATION

Off-Site Shipment (From TTR at NEVADA to NTS at NEVADA)

Tracking No: DPL03015

Carrier: GOVERNMENT TRUCK

COPY

CDL: ON FILE NV

Depart: 28-AUG-2003 11:00
Threshold: 28-AUG-2003 11:15

Arrival: 28-AUG-2003 15:30
Threshold: 28-AUG-2003 15:00

From: STEFAN DUKE
BECHTEL NEVADA
TONOPAH TEST RANGE
TONOPAH, NV 89049
Area:
Bldg:
Phone: 702-295-7365

To: SHANNON PARSON-DEPRY
BECHTEL NEVADA
BASE CAMP
MERCURY, NV 89023
Area: 05
Bldg: 5-7
Phone: 702-295-7211
Pager:
Mobile:

Entered By: DUKESJ

Date Modified: 25-AUG-2003

Shipped Material(s)	Package(s)	Unit(s)	UN/NA	Guide No.
WASTE NON-REGULATED WASTE DOT Non-Regulated < 70 Bq/g	5 BOX(ES)	41447.00 POUND(S) (GROSS)	—	—
WASTE NON-REGULATED WASTE DOT Non-Regulated < 70 Bq/g	6 DRUM(S)	3682.00 POUND(S) (GROSS)	—	—

24-Hr Emergency Response Number
702-295-0311

Secondary Emergency Response Contact And/Or Comments
ADAM DAEGORN 702-295-4779

Package Storage and Disposal Request

Shipment Number: DPL03015

Prepared By:

Date: 10-Sep-2003

Manifest Number:

Package No: 03L020 Contact (mSv/h): 0.0005 Completed Date: 18-Mar-2003
 Container Code: 102 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.265E-01 Gross Weight (kg): 2.680E+02 Total Activity (Bq): 5.076E+05
 Waste Volume (m³): 1.980E-01 Net Weight (kg): 2.440E+02 Activity Date: 07-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRYSLLFY00018	022		100		03	01-Jul-2003	U-238	4.400E+05
LRYSLLFY00018	022		100		03	01-Jul-2003	U-235	5.600E+03
LRYSLLFY00018	022		100		03	01-Jul-2003	U-234	6.200E+04

Package No: 03L021 Contact (mSv/h): 0.0005 Completed Date: 18-Mar-2003
 Container Code: 102 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.265E-01 Gross Weight (kg): 2.720E+02 Total Activity (Bq): 5.187E+05
 Waste Volume (m³): 1.980E-01 Net Weight (kg): 2.490E+02 Activity Date: 07-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRYSLLFY00018	022		100		03	01-Jul-2003	U-238	4.500E+05
LRYSLLFY00018	022		100		03	01-Jul-2003	U-235	5.700E+03
LRYSLLFY00018	022		100		03	01-Jul-2003	U-234	6.300E+04

Package No: 03L022 Contact (mSv/h): 0.0005 Completed Date: 18-Mar-2003
 Container Code: 102 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.265E-01 Gross Weight (kg): 2.770E+02 Total Activity (Bq): 5.298E+05
 Waste Volume (m³): 1.980E-01 Net Weight (kg): 2.530E+02 Activity Date: 07-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRYSLLFY00018	022		100		03	01-Jul-2003	U-238	4.600E+05
LRYSLLFY00018	022		100		03	01-Jul-2003	U-235	5.800E+03
LRYSLLFY00018	022		100		03	01-Jul-2003	U-234	6.400E+04

Package No: 03L023 Contact (mSv/h): 0.0005 Completed Date: 18-Mar-2003
 Container Code: 102 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.265E-01 Gross Weight (kg): 3.080E+02 Total Activity (Bq): 5.985E+05
 Waste Volume (m³): 1.980E-01 Net Weight (kg): 2.850E+02 Activity Date: 07-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRYSLLFY00018	022		100		03	01-Jul-2003	U-238	5.200E+05
LRYSLLFY00018	022		100		03	01-Jul-2003	U-235	6.500E+03
LRYSLLFY00018	022		100		03	01-Jul-2003	U-234	7.200E+04

Reviewed:

Package Storage and Disposal Request

Shipment Number: DPL03015

Date: 10-Sep-2003

Prepared By: *[Signature]*

Manifest Number:

Package No: 03L024 Contact (mSv/h): 0.0005 Completed Date: 18-Mar-2003
 Container Code: 102 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.265E-01 Gross Weight (kg): 2.810E+02 Total Activity (Bq): 5.409E+05
 Waste Volume (m³): 1.980E-01 Net Weight (kg): 2.580E+02 Activity Date: 07-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	4.700E+05
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	5.900E+03
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	6.500E+04

Package No: 03L025 Contact (mSv/h): 0.0005 Completed Date: 18-Mar-2003
 Container Code: 102 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.265E-01 Gross Weight (kg): 2.630E+02 Total Activity (Bq): 5.055E+05
 Waste Volume (m³): 1.980E-01 Net Weight (kg): 2.400E+02 Activity Date: 07-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	4.400E+05
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	5.500E+03
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	6.000E+04

Package No: 110884 Contact (mSv/h): 0.0005 Completed Date: 18-Mar-2003
 Container Code: 210 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.920E+00 Gross Weight (kg): 3.579E+03 Total Activity (Bq): 7.513E+06
 Waste Volume (m³): 2.550E+00 Net Weight (kg): 3.171E+03 Activity Date: 06-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	6.500E+06
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	7.300E+04
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	9.400E+05

Package No: 110889 Contact (mSv/h): 0.0005 Completed Date: 19-Mar-2003
 Container Code: 210 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.920E+00 Gross Weight (kg): 3.856E+03 Total Activity (Bq): 1.063E+07
 Waste Volume (m³): 2.550E+00 Net Weight (kg): 3.447E+03 Activity Date: 06-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	9.300E+06
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.300E+05
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	1.200E+06

Reviewed By: *[Signature]*

Package Storage and Disposal Request

Shipment Number: DPL03015

Date: 10-Sep-2003

Prepared By:

Manifest Number:

Package No: 110890 Contact (mSv/h): 0.0005 Completed Date: 18-Mar-2003
 Container Code: 210 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.920E+00 Gross Weight (kg): 3.583E+03 Total Activity (Bq): 9.750E+06
 Waste Volume (m³): 2.550E+00 Net Weight (kg): 3.175E+03 Activity Date: 06-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRYSLLFY00018	022		100		03	01-Jul-2003	U-238	8.500E+06
LRYSLLFY00018	022		100		03	01-Jul-2003	U-235	1.500E+05
LRYSLLFY00018	022		100		03	01-Jul-2003	U-234	1.100E+06

Package No: 110940 Contact (mSv/h): 0.0005 Completed Date: 19-Mar-2003
 Container Code: 210 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.920E+00 Gross Weight (kg): 3.915E+03 Total Activity (Bq): 1.266E+07
 Waste Volume (m³): 2.550E+00 Net Weight (kg): 3.506E+03 Activity Date: 06-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRYSLLFY00018	022		100		03	01-Jul-2003	U-238	1.100E+07
LRYSLLFY00018	022		100		03	01-Jul-2003	U-235	1.600E+05
LRYSLLFY00018	022		100		03	01-Jul-2003	U-234	1.500E+06

Package No: 110947 Contact (mSv/h): 0.0005 Completed Date: 19-Mar-2003
 Container Code: 210 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 2.920E+00 Gross Weight (kg): 3.842E+03 Total Activity (Bq): 2.840E+07
 Waste Volume (m³): 2.550E+00 Net Weight (kg): 3.434E+03 Activity Date: 06-Aug-2003

Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRYSLLFY00018	022		100		03	01-Jul-2003	U-238	2.500E+07
LRYSLLFY00018	022		100		03	01-Jul-2003	U-235	3.000E+05
LRYSLLFY00018	022		100		03	01-Jul-2003	U-234	3.100E+06

Reviewed By:

Certificate of Disposal

This is to certify that the, Waste Stream No., LRY5-LLFY00018 package numbers 110884, 110889, 110890, 110940, 110947, 03L020, 03L021, 03L022, 03L023, 03L024, 03L025 were shipped and received at the Nevada Test Site Radioactive Waste Management Site in Area 5 for disposal as stated below.

Stefan Duke

Bechtel Nevada Waste Generator Services

Scientist

Shipped by

Organization

Title

Signature

Date

8-22-03

Received by

BN
Organization

Title

Tech Staff

Signature

Date

8-28-03

Carrier No. _____

Page 1 of 1

Bechtel Nevada

(Name of carrier)

(SCAC)

Date 8-28-03

On Collect on Delivery shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 426, Sec. 1.

TO: Bechtel Nevada for US DOE

Street AREA 5 RUIMS NEVADA TEST SITE

City Mercury State NV Zip Code 89023

FROM: Bechtel Nevada for US DOE

Street Bunker II Site TTR

City TONGAH State NV Zip Code 89049

24 hr. Emergency Contact Tel. No. 702-295-0311

ATTN: Shannon Parsons - Deffy

No. of Units & Container Type	HM	BASIC DESCRIPTION Proper Shipping Name, Hazard Class, Identification Number (UN or NA), Packing Group, per 172.101, 172.202, 172.203	TOTAL QUANTITY (Weight, Volume, Gallons, etc.)	WEIGHT (Subject to Correction)	RATE	CHARGES (For Carrier Use Only)
7-B-15 Boxes		NON REGULATED WASTE L 70 Bg/yr	41447 lb.			
1-Drums		NON REGULATED WASTE L 70 Bg/yr	3682 lb.			
		TOTAL	45129 lb.			
<div style="position: absolute; top: 10px; left: 10px;">TRUCK # E104281</div> <div style="position: absolute; top: 30px; left: 10px;">Trailer # E102132</div> <div style="position: absolute; top: 50px; left: 10px;">LAST ITEM</div> <div style="position: absolute; top: 70px; left: 10px;">MONEY BACK</div>						

PLACARDS TENDERED: YES ☐ NO ☐

Note - (1) Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property, as follows: The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____.

(2) Where the applicable tariff provisions specify a limitation of the carrier's liability, the shipper is required to state a value declaration by the shipper and the shipper does not release the carrier's liability or declare a value, the carrier's liability shall be limited to the extent provided by such provisions. See NACM Item 172.

(3) Commodities requiring special or additional care or attention in handling or stowing shall be so marked and packaged as to ensure safe transportation. See section 224 Item 426, Bills of Lading, Freight Bills and Statements of Charges and Section 1(a) the Contract Terms and Conditions for a list of such articles.

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Signature _____

REMIT
C.O.D. TO:
ADDRESS

COD

Am: \$

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of Consignor)

G.O.D. FEE
PREPAID ☐
COLLECT ☐

TOTAL CHARGES: \$

FREIGHT CHARGES

FREIGHT PREPAID ☐ Check box if charges are to be collected

RECEIVED, subject to classification and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown, marked consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER Bechtel Nevada for US DOE

ER [Signature]

CARRIER Bechtel Nevada for US DOE

PER Ken [Signature]

DATE 8-27-03

2

HAZTRAK ENTRY CONFIRMATION

COPY

Off-Site Shipment (From TTR at NEVADA to NTS at NEVADA)

Tracking No: DPL03016

Carrier: GOVERNMENT TRUCK

Depart: 24-SEP-2003 09:00

Threshold: 24-SEP-2003 09:15

Arrival: 24-SEP-2003 13:15

Threshold: 24-SEP-2003 13:15

From: ADAM DAEGORN
BECHTEL NEVADA
TONAPAH
CAU410 ER SITE
TONAPAH, NV 89049
Area: CAU410
Bldg: ER SITE
Phone: 702-295-4779

To: SHANNON PARSONS-DEPRY
BECHTEL NEVADA
BASE CAMP
MERCURY, NV 89023

Area: 03
Bldg: 3C36 (AHAT)
Phone: 702-295-7211
Pager:

Entered By: DUKESJ

Date Modified: 16-SEP-2003

Shipped Material(s)	Package(s)	Unit(s)	UN/NA	Guide No.
WASTE NON-REGULATED WASTE	2 SUPER SACK(S)	33100.00 POUND(S) (GROSS)	—	—

24-Hr Emergency Response Number
702-295-0311

Secondary Emergency Response Contact And/Or Comments
HARRY PERRY 702-295-0885

Bechtel Nevada

GENERAL SHIPPING ORDER

NO. 2038041

OFF-SITE

9/16/2003 3:22PM

SHIP FROM

SHIPMENT INFORMATION

SHIP TO

BECHTEL NEVADA FOR USDOE
TONAPAH TEST RANGE
BECHTEL OFFICE
BASE CAMP
TONAPAH, NV 89049, USA
ADAM DAEGORN at 702/295-7365

REASON: GENERAL MOVEMENT
REQUIRED AT DESTINATION: 09/24/2003
CHARGES: PREPAID
CARRIER: GOVERNMENT TRUCK
PIECE(S): 2 WEIGHT: 33,100 LBS
SHIP DATE: 09/24/2003 ARRIVAL DATE: 09/24/2003
CHARGE/ORG NO: 5B03KB30/A510

BECHTEL NEVADA FOR USDOE
NEVADA TEST SITE
RECEIVING WAREHOUSE 160
MERCURY, NV 89023, USA
SHANNON PARSONS-DEPRY at 702/295-2799
REFERENCE NO.: N/A

LI	PROPERTY NO.	SERIAL NO.	MATERIAL DESCRIPTION	QUANTITY	U/M
1.00			NOT REGULATED WASTE (SOIL)	2.00	EA

03L041 TID 500302
03L040 TID 501183

[Signature]
Driver Signature

DARCYE LEWIS
Printed Name

9-24-03
Date

8:45
Time

[Signature]
Received by Signature

MICHAEL HALMARIL
Printed Name

9/24/03
Date

1420
Time

NAME Pat Schauer
DATE 9/24/03
BECHTEL NEVADA RWP

GENERAL SHIPPING REQUEST

NO. 2038041

9/16/2003 3:22PM

SHIP FROM

BECHTEL NEVADA FOR USDOE
TONAPAH TEST RANGE
BECHTEL OFFICE
BASE CAMP
TONAPAH, NV 89049, USA
ADAM DAEGORN at 702/295-7365
NTS AREA 52 TTR

OFF-SITE SHIPMENT

REQUIRED AT DESTINATION: 09/24/2003
REASON: GENERAL MOVEMENT
SHIP METHOD: MOVEMENT FROM ORIGINATOR'S LOCATION
CHARGES: PREPAID
ESTIMATED PIECE(S): 2 WEIGHT: 33,100 LBS
CHARGE/ORG NO: 5B03KB30/A510

SHIP TO

BECHTEL NEVADA FOR USDOE
NEVADA TEST SITE
RECEIVING WAREHOUSE 160

MERCURY, NV 89023, USA
NTS AREA 3 BLDG: RWMS
SHANNON PARSONS-DEPRY at 702/295-2799
REFERENCE NO.: N/A

LI	PROPERTY NO.	SERIAL NO.	MATERIAL DESCRIPTION	QUANTITY	U/M	VALUE
1.00			NOT REGULATED WASTE (SOIL) Do not pack, packed by originator, No Inventory Completed	2.00	EA	\$2.00

03L041 TID 500302
03L040 TID 501183

Adam C. Daegorn
Released by Signature

Adam C. Daegorn
Printed Name

09/24/03
Date

0345
Time

Michael H. Hallmark
Received by Signature

Michael H. Hallmark
Printed Name

9/24/03
Date

1420
Time

NAME Pat Schauer

DATE 9/24/03

BECHTEL NEVADA RWP

Package Storage and Disposal Request

Shipment Number: DPL03016

Date: 08-Sep-2003

Prepared By: *[Signature]*

Manifest Number:

Package No: 03L040 Contact (mSv/h): 0.0005 Completed Date: 29-Aug-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 Gross Weight (kg): 8.142E+03 Total Activity (Bq): 1.719E+07
 Waste Volume (m³): 6.170E+00 Net Weight (kg): 8.119E+03 Activity Date: 02-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LR5LLFY00018	022		100		03	01-Jul-2003	U-238	1.500E+07
LR5LLFY00018	022		100		03	01-Jul-2003	U-235	1.900E+05
LR5LLFY00018	022		100		03	01-Jul-2003	U-234	2.000E+06

Package No: 03L041 Contact (mSv/h): 0.0005 Completed Date: 29-Aug-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 Gross Weight (kg): 6.871E+03 Total Activity (Bq): 1.386E+07
 Waste Volume (m³): 6.170E+00 Net Weight (kg): 6.849E+03 Activity Date: 02-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LR5LLFY00018	022		100		03	01-Jul-2003	U-238	1.200E+07
LR5LLFY00018	022		100		03	01-Jul-2003	U-235	1.600E+05
LR5LLFY00018	022		100		03	01-Jul-2003	U-234	1.700E+06

Reviewed By: *[Signature]*

9/8/03

00603016

Low-Level Waste Certification

I certify that containers: 036040
036041

do not contain hazardous waste as defined in Title 40 CFR 261 or state of Nevada hazardous waste regulations:

1. According to the results of test performed in accordance with the requirements as specified in Subpart C of Title 261; and/or
2. According to the supporting documentation provided to me about the materials and processes that produced this waste.

To the best of my knowledge, I believe the information I have submitted is true, accurate, and complete.

Dennis Swick / [Signature]
Generator Waste Certification Official (Print Name/Sign)

9/24/03
Date

Certificate of Disposal

This is to certify that the, Waste Stream No., LRY5-LLFY00018 package numbers 03L040 and 03L041 were shipped and received at the Nevada Test Site Radioactive Waste Management Site in Area 3 for disposal as stated below.

Stefan Duke

Bechtel Nevada Waste Generator Services

Scientist

Stefan C. Duke
Shipped by

Bechtel Nevada Waste Generator Services
Organization

Scientist
Title

Stefan C. Duke
Signature

Date

09/24/03

Michelle Halmark
Received by

BN
Organization

Title

RWMS

Michelle Halmark
Signature

Date

9/24/03

HAZTRAK ENTRY CONFIRMATION

COPY

Off-Site Shipment (From TTR at NEVADA to NTS at NEVADA)

Tracking No: DPL03017

Carrier: GOVERNMENT TRUCK

Depart: 22-SEP-2003 10:00
Threshold: 22-SEP-2003 10:15

Arrival: 22-SEP-2003 15:30
Threshold: 22-SEP-2003 15:00

From: ADAM DAEGORN
BECHTEL NEVADA
TONAPAH
CAU410 ER SITE
TONAPAH, NV 89049
Area: CAU410
Bldg: ER SITE
Phone: 702-295-4779

To: SHANNON PARSONS-DEPRY
BECHTEL NEVADA
BASE CAMP
MERCURY, NV 89023

Area: 03
Bldg: 3C36 (AHAT)
Phone: 702-295-7211
Pager:

Entered By: DUKESJ

Date Modified: 15-SEP-2003

Shipped Material(s)	Package(s)	Unit(s)	UN/NA	Guide No.
WASTE	1 SEALAND CONTAINER(S)	6043.00 KILOGRAM(S) (GROSS)	2912	162
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) 7, UN2912, RADIONUCLIDES:U(DEPLETED) PHYSICAL FORM:SOLID CHEMICAL FORM:OXIDE PACKAGE ACTIVITY:305629 1.223E7 BQ CATEGORY:LSA-I EXCLUSIVE USE SHIPMENT				

24-Hr Emergency Response Number
702-295-0311

Secondary Emergency Response Contact And/Or Comments
HARRY PERRY 702-295-0685

On Collect or Delivery documents, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1

TO: **Bechtel Nevada for US DOE**
Consignee: **Attn: Shannon Parsons-DePry M/S NTS 403**

Street: **PO Box 95521**
City: **Las Vegas, Nevada** **State:** **89193** **Zip Code:**

FROM: **Bechtel Nevada for US DOE**
Shipper: **Attn: Adam DaeGorn**
Street: **Tonopah Test Range**
City: **State:** **Zip Code:**

24 Hr. Emergency Contact Tel. No.: **1-800-391-0311**

No. of Units & Container Type		BASIC DESCRIPTION		TOTAL QUANTITY	WEIGHT	RATE	CHARGES
		Proper Shipping Name, Hazard Class, Identification Number (UN or NA), Packing Group, per 172.101, 172.202, 172.203		(Weight, Volume, Gallons, etc.)	(Subject to Correction)		(For Carrier Use Only)
1 Cyl		HAZARDOUS MATERIAL USA 9005, UN 2912, UNCEPATED SCOD provide 1.223E7 Bq, Exclusive Use Shipment, USAF		6043 kg			
		SHIPMENT # 09103017					
		Tractor number- E 10 7150					
		Trailer number- 106254					
		Package number 305629 1.223E7 Bq					
		Package number 305629 TID #500310					
		NAME <u>Pat Scheuermann</u>					
		DATE <u>9/22/03</u>					
		BECHTEL NEVADA RWP					

PLACARDS TENDERED: YES ☐ NO ☐

Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by all means of transport. (DELETE NON-APPLICABLE MODE OF TRANSPORT) according to applicable international and national governmental regulations.

Signature: [Signature]

REMIT C.O.D. TO: ADDRESS

COD Amt: \$

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Signature of Consignor: _____

C.O.D. FEE: PREPAID ☐ COLLECT ☐ \$

TOTAL CHARGES: \$

FREIGHT CHARGES PREPAID ☐ COLLECT ☐ Check box if charges are to be collected

RECEIVED, subject to the classifications and lawfully fixed tariffs in effect on the date of the issue of the Bill of Lading, the property described above in apparent good order, except as noted hereon, and condition of contents of packages unknown, marked, consigned, and delivered as indicated above which said carrier the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of

said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

TO: **Bechtel Nevada for US DOE**
Signature: [Signature]
Date: 9-22-03

CARRIER: **Bechtel NV DOE**
PER: [Signature]
DATE: 9-22-03

Package Storage and Disposal Request

Shipment Number: DPL03017

Date: 11-Sep-2003

Prepared By:

Manifest Number:

Package No: 305629 Contact (mSv/h): 0.0005 Completed Date: 02-Sep-2003
Container Code: 220 1 Meter (mSv/h): 0.0005 Operation Type: B
External Volume (m³): 3.600E+01 Gross Weight (kg): 6.043E+03 Total Activity (Bq): 1.223E+07
Waste Volume (m³): 2.700E+01 Net Weight (kg): 3.673E+03 Activity Date: 03-Sep-2003
Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LR5LLFY00018	040		100		03	01-Jul-2003	U-238	1.071E+07
LR5LLFY00018	040		100		03	01-Jul-2003	U-235	1.457E+05
LR5LLFY00018	040		100		03	01-Jul-2003	U-234	1.378E+06

Reviewed By:

APL 03017

Low-Level Waste Certification

I certify that containers: 305629

do not contain hazardous waste as defined in Title 40 CFR 261 or state of Nevada hazardous waste regulations:

1. According to the results of test performed in accordance with the requirements as specified in Subpart C of Title 261; and/or
2. According to the supporting documentation provided to me about the materials and processes that produced this waste.

To the best of my knowledge, I believe the information I have submitted is true, accurate, and complete.

Dennis Swick / [Signature]
Generator Waste Certification Official (Print Name/Sign)

9/22/03
Date

Certificate of Disposal

This is to certify that the, Waste Stream No., LRY5-LLFY00018 package numbers 305629 was shipped and received at the Nevada Test Site Radioactive Waste Management Site in Area 3 for disposal as stated below.

Stefan Duke

Bechtel Nevada Waste Generator Services

Scientist

Shipped by

Organization

Title

Signature

Date

9-22-03

Received by

Organization

Title

Signature

Date

BN

RWMS

9/22/03

HAZTRAK ENTRY CONFIRMATION

COPY

Off-Site Shipment (From TTR at NEVADA to NTS at NEVADA)

Tracking No: DPL03018
Carrier: GOVERNMENT TRUCK

CDL: ON FILE NV

Depart: 24-SEP-2003 09:00
Threshold: 24-SEP-2003 09:15

Arrival: 24-SEP-2003 13:15
Threshold: 24-SEP-2003 13:15

From: ADAM DAEGORN
BECHTEL NEVADA
TONAPAH
CAU410 ER SITE
TONAPAH, NV 89049
Area: CAU410
Bldg: ER SITE
Phone: 702-295-4779

To: SHANNON PARSONS-DEPRY
BECHTEL NEVADA
BASE CAMP
MERCURY, NV 89023

Area: 03
Bldg: 3C36 (AHAT)
Phone: 702-295-7211
Pager:

Entered By: DUKESJ

Date Modified: 16-SEP-2003

Shipped Material(s)	Package(s)	Unit(s)	UN/NA	Guide No.
WASTE NON-REGULATED WASTE	2 SUPER SACK(S)	33150.00 POUND(S) (GROSS)	—	—

24-Hr Emergency Response Number
702-295-0311

Secondary Emergency Response Contact And/Or Comments
HARRY PERRY 702-295-0685

GENERAL SHIPPING ORDER

NO. 2038045

OFF-SITE

9/16/2003 3:13PM

SHIP FROM

BECHTEL NEVADA FOR USDOE
TONAPAH TEST RANGE
BECHTEL OFFICE
BASE CAMP
TONAPAH, NV 89049, USA
ADAM DAEGORN at 702/295-7365

SHIPMENT INFORMATION

REASON: GENERAL MOVEMENT
REQUIRED AT DESTINATION: 09/24/2003
CHARGES: PREPAID
CARRIER: GOVERNMENT TRUCK
PIECE(S): 2 WEIGHT: 33,150 LBS
SHIP DATE: 09/24/2003 ARRIVAL DATE: 09/24/2003
CHARGE/ORG NO: 5B03KB30/A510

SHIP TO

BECHTEL NEVADA FOR USDOE
NEVADA TEST SITE
RECEIVING WAREHOUSE 160
MERCURY, NV 89023, USA
SHANNON PARSONS-DEPRY at 702/295-2799
REFERENCE NO.: N/A

PROPERTY NO.	SERIAL NO.	MATERIAL DESCRIPTION	QUANTITY	U/M
--------------	------------	----------------------	----------	-----

1.00

NON REGULATED WASTE (SOILS)

03L042 TID 500336
03L043 TID 500341

2.00 EA

Kenn R. [Signature]

Driver Signature

Ken R. [Signature]

Printed Name

9/24/03

Date

8:30

Time

[Signature]

Received By Signature

MICHAEL HALLMARK

Printed Name

9/24/03

Date

14:20

Time

BECHTEL NEVADA RWP

DATE

NAME

NAME

DATE

BECHTEL NEVADA RWP

9/16/2003 3:13PM

SHIP FROM

BECHTEL NEVADA FOR USDOE
TONAPAH TEST RANGE
BECHTEL OFFICE
BASE CAMP
TONAPAH, NV 89049, USA
ADAM DAEGORN at 702/295-7365
NTS AREA 52 TTR

OFF-SITE SHIPMENT

REQUIRED AT DESTINATION: 09/24/2003
REASON: GENERAL MOVEMENT
SHIP METHOD: MOVEMENT FROM ORIGINATOR'S LOCATION
CHARGES: PREPAID
ESTIMATED PIECE(S): 2 WEIGHT: 33,150 LBS
CHARGE/ORG NO: 5B03KB30/A510

SHIP TO

BECHTEL NEVADA FOR USDOE
NEVADA TEST SITE
RECEIVING WAREHOUSE 160

MERCURY, NV 89023, USA
NTS AREA 3 BLDG: RWMS
SHANNON PARSONS-DEPRY at 702/295-2799
REFERENCE NO.: N/A

LI	PROPERTY NO	SERIAL NO	MATERIAL DESCRIPTION	QUANTITY	U/M	VALUE
1.00			NON REGULATED WASTE (SOILS)	2.00	EA	\$66,300.0

Do not pack, packed by originator, No Inventory Completed

03L042 TID 500336

03L043 TID 500341

Released by Signature

Printed Name

09/24/03
Date

08:30
Time

Received by Signature

Printed Name

9/24/03
Date

14:20
Time

NAME
DATE 9/24/03
BECHTEL NEVADA RWP

Package Storage and Disposal Request

Shipment Number: DPL03018

Date: 08-Sep-2003

Prepared By: *[Signature]*

Manifest Number:

Package No: 03L042 Contact (mSv/h): 0.0005 Completed Date: 29-Aug-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 Gross Weight (kg): 7.552E+03 Total Activity (Bq): 1.607E+07
 Waste Volume (m³): 6.170E+00 Net Weight (kg): 7.529E+03 Activity Date: 02-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	1.400E+07
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.700E+05
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	1.900E+06

Package No: 03L043 Contact (mSv/h): 0.0005 Completed Date: 29-Aug-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 Gross Weight (kg): 7.507E+03 Total Activity (Bq): 1.607E+07
 Waste Volume (m³): 6.170E+00 Net Weight (kg): 7.484E+03 Activity Date: 02-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	1.400E+07
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.700E+05
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	1.900E+06

Reviewed By: *[Signature]*

9/8/03

DPL03018

I v-Level Waste Certification

I certify that containers: 03L042
03L043

do not contain hazardous waste as defined in Title 40 CFR 261 or state of Nevada hazardous waste regulations:

1 According to the results of test performed in accordance with the requirements as specified in Subpart C of Title 261; and/or

2 According to the supporting documentation provided to me about the materials and processes that produced this waste.

3 To the best of my knowledge, I believe the information I have submitted is true, accurate, complete.

Lewis Swick / [Signature]

Generator Waste Certification Official (Print Name/Sign)

9/23/03

Date

Certificate of Disposal

This is to certify that the, Waste Stream No., LRY5-LLFY00018 package numbers 03L042 and 031043 were shipped and received at the Nevada Test Site Radioactive Waste Management Site in Area 3 for disposal as stated below.

Stefan Duke <u>Stefan Duke</u>	Bechtel Nevada Waste Generator Services	Scientist
<u>Stefan Duke</u>	<u>Organization</u>	<u>Title</u>
<u>Stefan Duke</u>		<u>09/24/03</u>
Signature		Date
<u>MICHELLE HALLMARK</u>	<u>BN</u>	<u>RWMS</u>
Received by	Organization	Title
<u>MICHELLE HALLMARK</u>		<u>9/24/03</u>
Signature		Date

HAZTRAK ENTRY CONFIRMATION

COPY

Off-Site Shipment (From TTR at NEVADA to NTS at NEVADA)

Tracking No: DPL03020

Carrier: GOVERNMENT TRUCK

CDL: ON FILE NV

Depart: 22-SEP-2003 10:00
Threshold: 22-SEP-2003 10:15

Arrival: 22-SEP-2003 15:30
Threshold: 22-SEP-2003 15:00

From: ADAM DAEGORN
BECHTEL NEVADA
TONAPAH
CAU410 ER SITE
TONAPAH, NV 89049
Area: CAU410
Bldg: ER SITE
Phone: 702-295-4779

To: SHANNON PARSONS-DEPRY
BECHTEL NEVADA
BASE CAMP
MERCURY, NV 89023
Area: 03
Bldg: 3C36 (AHAT)
Phone: 702-295-7211
Pager:

Entered By: DUKESJ

Date Modified: 15-SEP-2003

Shipped Material(s)	Package(s)	Unit(s)	UN/NA	Guide No.
REPORTABLE QUANTITY, WASTE	2 SUPER SACK(S)	13165.00 KILOGRAM(S) (GROSS)	2912	162
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) 7, UN2912. RADIONUCLIDES:U(DEPLETED) PHYSICAL FORM:SOLID CHEMICAL FORM:OXIDE PACKAGE ACTIVITY:03L044 6.9E9BQ, 03L045 7.1E9BQ CATEGORY:LSA-I EXCLUSIVE USE SHIPMENT				

24-Hr Emergency Response Number
702-295-0311

Secondary Emergency Response Contact And/Or Comments
HARRY PERRY 702-295-0685

(SCAC)

Date _____

TO: _____
Consignee _____

City _____ State _____ Zip Code _____

24 hr. Emergency Contact Tel. No.

**Vehicle
Number**

DATE _____

2

PRINTED ON RECYCLED PAPER
USING SOYBEAN INK

STYLE F65 LABELMASTER, An American Labelmark Co., Chicago, IL 60646 800/621-5808

Package Storage and Disposal Request

Shipment Number: DPL03020

Date: 15-Sep-2003

Prepared By:

Manifest Number:

Package No: 03L044 / Contact (mSv/h): 0.0005 Completed Date: 03-Sep-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 / Gross Weight (kg): 6.514E+03 / Total Activity (Bq): 6.921E+09 /
 Waste Volume (m³): 6.170E+00 / Net Weight (kg): 6.492E+03 / Activity Date: 10-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	9.100E+08
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.100E+07
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	6.000E+09

Package No: 03L045 / Contact (mSv/h): 0.0005 Completed Date: 03-Sep-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 / Gross Weight (kg): 6.651E+03 / Total Activity (Bq): 7.041E+09 /
 Waste Volume (m³): 6.170E+00 / Net Weight (kg): 6.628E+03 / Activity Date: 10-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	9.300E+08
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.100E+07
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	6.100E+09

Reviewed By:

07/15/03

07LC3020

Low-Level Waste Certification

I certify that containers: 03LC44
03LC45

do not contain hazardous waste as defined in Title 40 CFR 261 or state of Nevada hazardous waste regulations:

1. According to the results of test performed in accordance with the requirements as specified in Subpart C of Title 261; and/or
2. According to the supporting documentation provided to me about the materials and processes that produced this waste.

To the best of my knowledge, I believe the information I have submitted is true, accurate, and complete.

DENNIS SWICK / [Signature]
Generator Waste Certification Official (Print Name/Sign)

9/12/03
Date

Certificate of Disposal

This is to certify that the, Waste Stream No., LRY5-LLFY00018 package numbers 03L044 and 03L045 were shipped and received at the Nevada Test Site Radioactive Waste Management Site in Area 3 for disposal as stated below.

Stefan Duke

Bechtel Nevada Waste Generator Services

Scientist

Shipped by

Organization

Title

Signature

Date _____

9-22-03

MICHAEL HAMMARIL
Received by

BN
Organization

Title

RWMS

Richard H. Hark
Signature

Date _____

9/22/03

HAZTRAK ENTRY CONFIRMATION

COPY

Off-Site Shipment (From TTR at NEVADA to NTS at NEVADA)

Tracking No: DPL03021

Carrier: GOVERNMENT TRUCK

Depart: 22-SEP-2003 10:00

Threshold: 22-SEP-2003 10:15

Arrival: 22-SEP-2003 15:30

Threshold: 22-SEP-2003 15:00

From: ADAM DAEGORN
BECHTEL NEVADA
TONAPAH
CAU410 ER SITE
TONAPAH, NV 89049
Area: CAU410
Bldg: ER SITE
Phone: 702-295-4779

To: SHANNON PARSONS-DEPRY
BECHTEL NEVADA
BASE CAMP
MERCURY, NV 89023

Area: 03
Bldg: 3C36 (AHAT)
Phone: 702-295-7211
Pager:

Entered By: DUKESJ

Date Modified: 15-SEP-2003

Shipped Material(s)	Package(s)	Unit(s)	UN/NA	Guide No.
REPORTABLE QUANTITY, WASTE	2 SUPER SACK(S)	16888.00 KILOGRAM(S) (GROSS)	2912	162
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) 7, UN2912, RADIONUCLIDES:U(DEPLETED) PHYSICAL FORM:SOLID CHEMICAL FORM:OXIDE PACKAGE ACTIVITY:03L046 9.0E9BQ, 03L047 9.0E9BQ CATEGORY:LSA-I EXCLUSIVE USE SHIPMENT				

24-Hr Emergency Response Number
702-295-0311

Secondary Emergency Response Contact And/Or Comments
HARRY PERRY 702-295-0685

Date _____

(SCAC)

City Las Vegas, Nevada State NV Zip Code 89103

24 hr. Emergency Contact Tel. No. _____

DATE 9-22-03

Package Storage and Disposal Request

Shipment Number: DPL03021

Date: 15-Sep-2003

Prepared By: *[Signature]*

Manifest Number:

Package No: 03L046 Contact (mSv/h): 0.0005 Completed Date: 04-Sep-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 ✓ Gross Weight (kg): 8.467E+03 ✓ Total Activity (Bq): 9.014E+09 ✓
 Waste Volume (m³): 6.170E+00 ✓ Net Weight (kg): 8.444E+03 ✓ Activity Date: 09-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	1.200E+09 ✓
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.400E+07 ✓
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	7.800E+09 ✓

Package No: 03L047 Contact (mSv/h): 0.0005 Completed Date: 04-Sep-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 ✓ Gross Weight (kg): 8.421E+03 ✓ Total Activity (Bq): 9.014E+09 ✓
 Waste Volume (m³): 6.170E+00 ✓ Net Weight (kg): 8.399E+03 ✓ Activity Date: 09-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	1.200E+09 ✓
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.400E+07 ✓
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	7.800E+09 ✓

02LC3021

Low-Level Waste Certification

I certify that containers: 03LC46
03LC47

do not contain hazardous waste as defined in Title 40 CFR 261 or state of Nevada hazardous waste regulations:

1. According to the results of test performed in accordance with the requirements as specified in Subpart C of Title 261; and/or
2. According to the supporting documentation provided to me about the materials and processes that produced this waste.

To the best of my knowledge, I believe the information I have submitted is true, accurate, and complete.

DENNIS SWICK / [Signature]
Generator Waste Certification Official (Print Name/Sign)

9/22/03
Date

Certificate of Disposal

This is to certify that the, Waste Stream No., LRY5-LLFY00018 package numbers 03L046 and 03L047 were shipped and received at the Nevada Test Site Radioactive Waste Management Site in Area 3 for disposal as stated below.

Stefan Duke

Bechtel Nevada Waste Generator Services

Scientist

Shipped by

Organization

Title

Signature

Date

9-22-03

ED TAKAHASHI

Received by

BN WOOD

Organization

Title

SCIENTIST

Signature

Date

22-SEP-2003

COPY

Tracking No: DPL03022
Carrier: GOVERNMENT TRUCK

Arrival: 23-SEP-2003 15:30
Threshold: 23-SEP-2003 15:00

To: SHANNON PARSONS-DEPRY
BECHTEL NEVADA
BASE CAMP
MERCURY, NV 89023

Area: 03
Bldg: 3C36 (AHAT)
Phone: 702-295-7211
Pager:

Date Modified: 15-SEP-2003

Shipped Material(s)	Package(s)	Unit(s)	UN/NA	Guide No.
REPORTABLE QUANTITY, WASTE	2 SUPER SACK(S)	17047.00 KILOGRAM(S) (GROSS)	2912	162
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) 7, UN2912. RADIONUCLIDES:U(DEPLETED) PHYSICAL FORM:SOLID CHEMICAL FORM:OXIDE PACKAGE ACTIVITY:03L048 9.0E9BQ, 03L049 9.2E9BQ CATEGORY:LSA-I EXCLUSIVE USE SHIPMENT				

24-Hr Emergency Response Number
702-295-0311

Secondary Emergency Response Contact And/Or Comments
HARRY PERRY 702-295-0685

Bechtel Nevada

Shipper No. _____

Carrier No. _____

9-15-03

Date _____

(Name of carrier)

(SCAC)

On Called on Delivery shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1

TO: **Bechtel Nevada for US DOE**
 Consignee: **Adam Shannon Parsons-DeFry M/S NTS 403**

Street **PO Box 98121**
 City **Las Vegas, Nevada** State **NV** Zip Code **89193**

FROM: **Bechtel Nevada for US DOE**

Shipper: **Adam Shannon Parsons-DeFry**

Street **Tenopah Test Range**

City **Tenopah** State **NV** Zip Code **89193**

24 hr. Emergency Contact Tel. No. _____

No. of Units & Container Type	Haz	BASIC DESCRIPTION Proper Shipping Name, Hazard Class, Identification Number (UN or NA), Packing Group, per 172.101, 172.202, 172.203	TOTAL QUANTITY (Weight, Volume, Gallons, etc.)	WEIGHT (Subject to Correction)	RATE	CHARGES (For Carrier Use Only)
1 Bn		Radioactive materials: LSA n.o.s., TID 500322, U (depleted), solid, wide, 1.83E10 Bq, Exclusive Use Shipment, LSA-I.	17047 kg			
		SHIPMENT # 79103022				
		Tractor number- 203864 Trailer number- 100035				
		Package number 03L048 9.0E9 Bq Package number 03L049 9.2E9 Bq				
		Package number 03L048 TID 500348 Package number 03L049 TID 500323				

PLACARDS TENDERED: YES ☒ NO ☐

Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

he agreed or declared value of the property is hereby stated by the shipper to be not exceeding _____

I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by B-Rail (Railroad) or Motor (SELETE NON-APPLICABLE MODE OF TRANSPORT) according to applicable international and national governmental regulations.

Adam Shannon Parsons-DeFry Signature

REMIT
C.O.D. TO:
ADDRESS

COD

Am: \$

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
 The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of Consignor)

C.O.D. FEE:
PREPAID ☐
COLLECT ☐

TOTAL CHARGES: \$

FREIGHT CHARGES

FREIGHT PREPAID ☐ Check box if charges are to be collected when bill is checked ☐

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this bill of lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown, marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of

said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.
 Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

PER **Bechtel Nevada for US DOE**

Adam C. DeFry

Adam Shannon Parsons-DeFry 09/23/03

CARRIER

BECHTEL NEV FOR U.S DOE

PER

Adam Shannon Parsons-DeFry

DATE

9-23-03

1

Package Storage and Disposal Request

Shipment Number: DPL03022

Date: 15-Sep-2003

Prepared By: SPK

Manifest Number:

Package No: 03L048 Contact (mSv/h): 0.0005 Completed Date: 04-Sep-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 / Gross Weight (kg): 8.421E+03 / Total Activity (Bq): 9.014E+09 /
 Waste Volume (m³): 6.170E+00 / Net Weight (kg): 8.399E+03 / Activity Date: 09-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	1.200E+09
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.400E+07
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	7.800E+09

Package No: 03L049 Contact (mSv/h): 0.0005 Completed Date: 04-Sep-2003
 Container Code: 230 1 Meter (mSv/h): 0.0005 Operation Type: B
 External Volume (m³): 6.850E+00 / Gross Weight (kg): 8.626E+03 / Total Activity (Bq): 9.215E+09 /
 Waste Volume (m³): 6.170E+00 / Net Weight (kg): 8.603E+03 / Activity Date: 09-Sep-2003
 Comment:

Waste Stream /Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRY5LLFY00018	022		100		03	01-Jul-2003	U-234	1.200E+09
LRY5LLFY00018	022		100		03	01-Jul-2003	U-235	1.500E+07
LRY5LLFY00018	022		100		03	01-Jul-2003	U-238	8.000E+09

Reviewed By: Adel Dada

09/15/03

Certificate of Disposal

This is to certify that the, Waste Stream No., LRY5-LLFY00018 package numbers 03L048 and 03L049 were shipped and received at the Nevada Test Site Radioactive Waste Management Site in Area 3 for disposal as stated below.

Stefan Duke

Bechtel Nevada Waste Generator Services

Scientist

Shipped by

Organization

Title

Signature

Date

Stefan Duke for Stefan Duke

09/28/03

Received by

Organization

Title

Michael Triunfel

BN

RW

Signature

Date

Michael Triunfel

9/23/03

Shipment #
DPL03022

Low-Level Waste Certification

I certify that containers: 036048
036049

do not contain hazardous waste as defined in Title 40 CFR 261 or state of Nevada hazardous waste regulations:

1. According to the results of test performed in accordance with the requirements as specified in Subpart C of Title 261; and/or
2. According to the supporting documentation provided to me about the materials and processes that produced this waste.

To the best of my knowledge, I believe the information I have submitted is true, accurate, and complete.

Dennis Swick/ alund
Generator Waste Certification Official (Print Name/Sign)

9/23/03
Date

HAZTRAK ENTRY CONFIRMATION

COPY

Off-Site Shipment (From TTR at NEVADA to NTS at NEVADA)

Tracking No: DPL03023

Carrier: GOVERNMENT TRUCK

CDL: ON FILE NV

Depart: 23-SEP-2003 10:30

Arrival: 23-SEP-2003 15:30

Threshold: 23-SEP-2003 10:45

Threshold: 23-SEP-2003 15:00

From: ADAM DAEGORN
BECHTEL NEVADA
TONAPAH
CAU410 ER SITE
TONAPAH, NV 89049
Area: CAU410
Bldg: ER SITE
Phone: 702-295-4779

To: SHANNON PARSONS-DEPRY
BECHTEL NEVADA
BASE CAMP
MERCURY, NV 89023
Area: 03
Bldg: 3C36 (AHAT)
Phone: 702-295-7211
Pager:

Entered By: DUKESJ

Date Modified: 15-SEP-2003

Shipped Material(s)

	Package(s)	Unit(s)	UN/NA	Guide No.
REPORTABLE QUANTITY, WASTE	1 SUPER SACK(S)	7105.00 KILOGRAM (S) (GROSS)	2912	162
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) 7, UN2912 RADIONUCLIDES:U(DEPLETED) PHYSICAL FORM:SOLID CHEMICAL FORM:OXIDE PACKAGE ACTIVITY:03L050 7.612E9 BQ CATEGORY:LSA-I EXCLUSIVE USE SHIPMENT				

24-Hr Emergency Response Number
702-295-0311

Secondary Emergency Response Contact And/Or Comments
HARRY PERRY 702-295-0685

[SCAC]

Zip Code

~~1-70-25-24~~

STYLE #66 LABELMASTER, An American Labelmark Co., Chicago, IL 60646 800/621-5806

PRINTED ON RECYCLED PAPER
USING SOYBEAN INK

Certificate of Disposal

This is to certify that the, Waste Stream No., LRY5-LLFY00018 package numbers 03L050 was shipped and received at the Nevada Test Site Radioactive Waste Management Site in Area 3 for disposal as stated below.

Stefan Duke

Bechtel Nevada Waste Generator Services

Scientist

Shipped by

Organization

Title

Adrian Duke for Stefan Duke
Signature

Date

09/22/03

Michelle Hallmark
Received by

BN
Organization

Title

RWMS

MICHELLE HALLMARK
Signature

Date

9/23/03

Shipment #

0PL03023

Low-Level Waste Certification

I certify that containers: 034050

do not contain hazardous waste as defined in Title 40 CFR 261 or state of Nevada hazardous waste regulations:

1. According to the results of test performed in accordance with the requirements as specified in Subpart C of Title 261; and/or
2. According to the supporting documentation provided to me about the materials and processes that produced this waste.

To the best of my knowledge, I believe the information I have submitted is true, accurate, and complete.

Dennis Swick/alen

Generator Waste Certification Official (Print Name/Sign)

9/23/03

Date

Manifest Number:

Waste Volume (m³): 6.170E+00

Net Weight (kg): 7.082E+03 ✓

Activity Date: 10-Sep-2003

Comment:

Waste Stream Profile	Form Code	Form Description	Treatment Code	Treatment Description	Rev. No.	Revision Date	Nuclide	Qty (Bq)
LRYSLLFY00018	022		100					
LRYSLLFY00018	022		100		03	01-Jul-2003	U-234	1.000E+09
LRYSLLFY00018	022		100		03	01-Jul-2003	U-235	1.200E+07
LRYSLLFY00018	022		100		03	01-Jul-2003	U-238	6.600E+09

Rev: 21 Eyr

Appendix F

Nevada Division of Environmental Protection Comment Responses

NEVADA ENVIRONMENTAL RESTORATION PROJECT DOCUMENT REVIEW SHEET

1. Document Title/Number: <u>Draft Corrective Action Decision Document/Closure Report for Corrective Action Unit 410: Waste Disposal Trenches, Tonopah Test Range, Nevada</u>			2. Document Date: November 2003	
3. Revision Number: 0			4. Originator/Organization: Stoller-Navarro	
5. Responsible NNSA/NV ERP Project Mgr.: Janet Appenzeller-Wing			6. Date Comments Due: December 4, 2003	
7. Review Criteria: Full				
8. Reviewer/Organization/Phone No.: Clem Goewert/Don Elle, NDEP, 486-2874			9. Reviewer's Signature:	
10. Comment Number/ Location	11. Type*	12. Comment	13. Comment Response	14. Accept
		NDEP has no comments on this document.		

^a Comment Types: M = Mandatory, S = Suggested.

Return Document Review Sheets to NNSA/NV Environmental Restoration Division, Attn: QAC, M/S 505.

ALLEN BIAGGI, Administrator

STATE OF NEVADA

KENNY C. GUINN

Governor

Appendix F

Revision: 0

Date: 12/22/2003

Page F-2 of F-2

R. MICHAEL TURNIPSEED, Director

Administration

Water Pollution Control

Air Quality

(702) 486-2850

Federal Facilities

Corrective Actions

Waste Management

Facsimile 486-2863

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

(Las Vegas Office)

1771 E. Flamingo Road, Suite 121-A

Las Vegas, Nevada 89119-0837

November 24, 2003

Ms. Rumore C. Wycoff

Director, Environmental Restoration Division

Nevada Nuclear Security Administration

Nevada Site Office

P. O. Box 98518

Las Vegas, NV 89193-8518

RE: Review of Draft CADD/CR
 Corrective Action Unit 410, Waste Disposal Trenches
 Federal Facility Agreement and Consent Order

The Nevada Division of Environmental Protection, Bureau of Federal Facilities (NDEP) staff reviewed the draft Corrective Action Decision/ Closure Report (CADD/CR) for Corrective Action Unit (CAU) 410, Waste Disposal Trenches. NDEP's review of this document did not indicate any deficiencies.

Address any questions regarding this matter to either Clem Goewert at (702) 486-2865, or me at (702) 486-2874

Sincerely,

Don Elle, PhD

Supervisor

Bureau of Federal Facilities

TM/ KKB/DRE/CG

cc: Ken Hoar, Director, ES&HD, NNSA/NSO
 Patti Hall, EM, NNSA/ NSO
 Wayne Griffin, BN/DTRA
 Janet Appenzeller-Wing, ERD, NNSA/ NSO

Eric Shanholtz, Chief, DTRA
 Frank Di Sanza, WMD, NNSA/ NSO
 Tiffany Lantow, DTRA/TDTN
 Kevin Cabbie, ERD, NNSA/NSO

ACTION

INFO

NSO/MGR

AMEM

AMNS

AMSO

AMSSP

ERD ES&HD TD WMD NSO/MGR

Distribution

*Provide copy in initial distribution of Revision 0 and subsequent revisions, if applicable. Copies of the NDEP-approved document will be distributed to others.

Copies

Terre Maize
State of Nevada
Bureau of Federal Facilities
Division of Environmental Protection
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Las Vegas, NV 89119

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Bureau of Federal Facilities
Division of Environmental Protection
1771 E. Flamingo Rd., Suite 121-A
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2 (Uncontrolled)*

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Nellis Air Force Base, NV 89191-7007

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Tonopah, NV 89049

1 (Uncontrolled)*

FFACO Support Office
Stoller-Navarro
7710 W. Cheyenne Ave., Bldg. 3
Las Vegas, NV 89129

1 (Controlled)

Southern Nevada Public Reading Facility
c/o Nuclear Testing Archive
P.O. Box 98521, M/S 400
Las Vegas, NV 89193-8521

1 (Controlled)

1 (Uncontrolled)

Manager, Northern Nevada FFACO
Public Reading Facility
c/o Nevada State Library & Archives
Carson City, NV 89701-4285

1 (Uncontrolled)

U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831-0062

1 (Uncontrolled, electronic copy)

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Technical Library
P.O. Box 98518, M/S 505
Las Vegas, NV 89193-8518

1 (Uncontrolled)

Stoller-Navarro
Central Files
7710 W. Cheyenne Ave., Bldg. 3
Las Vegas, NV 89129

1 (Uncontrolled)*