

*Barbara*

# Los Alamos National Laboratory

UNIVERSITY OF CALIFORNIA



Environmental Restoration Project  
MS M992  
Los Alamos, New Mexico 87545  
505-667-0808/FAX 505-665-4747

Date: September 13, 1996  
Refer to: EM/ER:96-487

Mr. Ted Taylor  
Los Alamos Area Office  
US Department of Energy, MS A316  
Los Alamos, NM 87544

**SUBJECT: FINAL VCA PLANS FOR TAs-11, -33, AND -46,  
PRs 11-001(c), 33-007(c), and 46-003(h) ACTIVITIES**

Dear Ted:

Enclosed for your records please find two copies of the final Voluntary Corrective Action (VCA) Plans for Technical Areas 11, 33, and 46, Potential Release Sites 11-001(c), 33-007(c), and 46-003(h) activities. These activities are planned for completion in Fiscal Year 1996.

Your Field Project Coordinator participated in developing and reviewing these plans. The VCA Checklist and Field Authorization Forms have been completed and signed and are included in the enclosed plans.

Informational copies of these VCA Plans are being distributed to the regulators.

If you have any questions, please call Roy Michelotti at (505) 665-7444 or Joe Mose at (505) 667-5808. Thank you for your cooperation in this matter.

Sincerely,

*Jorg Jansen*  
Jorg Jansen  
Program Manager

JJ/bp



3446

- Enclosures: (1) Final VCA Plans For TAs-11, -33, and -46, PRSs 11-001(c),  
33-007(c), and 46-003(h)  
(2) VCA Checklist and Field Work Authorization Forms

Cy (w/ encs.):

B. Garcia, NMED-HRMB (2 copies)  
D. Griswold, AL-ERD, MS A906  
J. Harry, EES-5, MS M992  
B. Hoditschek, NMED-HRMB  
M. Leavitt, NMED-GWQB  
R. Michelotti, CST-18, MS E525  
J. Mose, LAAO, MS A316  
N. Naraine, DOE-HQ, EM-453  
D. Neleigh, EPA, R.6, 6PD-N (2 copies)  
J. Piatt, NMED-SWQB  
M. Shaner, CIO, MS A117 (2 copies)  
N. Weber, NMED-AIP  
J. White, ESH-19, MS K490  
S. Yanicak, NMED-AIP, MS J993  
RPF, MS M707

Cy (w/o encs.):

T. Baca, EM, MS J591  
D. Bradbury, EM/ER, MS M992  
T. Glatzmaier, DDEES/ER, MS M992  
D. McInroy, EM/ER, MS M992  
J. Levings, AL-ERD, MS A906  
W. Spurgeon, DOE-HQ, EM-453  
J. Vozella, LAAO, MS A316  
K. Zamora, LAAO, MS A316  
EM/ER File, MS M992

**Voluntary Corrective  
Action Plan  
for  
Solid Waste  
Management Unit**

11-001(c)

Field Unit 3

**Environmental  
Restoration  
Project**

September 1996

A Department of Energy  
Environmental Cleanup Program

**Los Alamos**  
NATIONAL LABORATORY

LA-UR-96-3000

**CONTENTS**

**1.0 INTRODUCTION .....1**

    1.1 Site Type and Description.....1

        1.1.1 Operational History .....1

        1.1.2 Contaminants of Potential Concern and Rationale for Proposed Remedial Action .....1

**2.0 SITE CHARACTERIZATION.....2**

    2.1 Rfi Information/Other Decision Data.....2

        2.1.1 Field Investigation for SWMU 11-001(c).....2

        2.1.2 Background Comparison .....6

**3.0 PROPOSED REMEDY.....7**

    3.1 Description of the Proposed Remedial Action .....7

    3.2 Basis for Cleanup Levels .....8

    3.3 Site Restoration.....9

**4.0 WASTE MANAGEMENT.....9**

    4.1 Estimated Types and Volumes of Waste.....9

    4.2 Method of Management and Disposal.....10

**5.0 DESCRIPTION OF CONFIRMATORY/VERIFICATION SAMPLING.....10**

**6.0 ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES.....10**

**7.0 ANNEXES .....12**

    7.1 Risk-Based Cleanup Level Assumptions and Calculations .....12

    7.2 RFI Analytical Results .....12

    7.3 Implementation SOPs .....12

    7.4 Quality Assurance Plan.....12

    7.5 Site-Specific Health and Safety Plan.....13

*VCA Plan*

---

7.6	Characterization Strategy Form.....	15
7.7	VCA Checklist and Fieldwork Authorization Form .....	17
7.8	Cost Estimate.....	19
<b>8.0</b>	<b>REFERENCES</b>	<b>20</b>
<b>9.0</b>	<b>ATTACHMENTS</b>	<b>21</b>

**LIST OF TABLES**

Table 2.1-1 Sample Depths and Locations.....4

Table 2.1-2 Screening Results for VOCs.....4

Table 2.1-3 Summary of Analytical Request Numbers for Samples Collected at SWMU 11-001(c).....5

Table 2.1-4 Inorganics with Concentrations Greater Than Background UTLs for SWMU 11-001(c).....6

Table 2.1-5 SWMU 11-001(c) Soil Concentrations for Organic Analytes With Values Greater Than Detection Limits .....7

Table 4.1-1 Estimated Waste Types and Volumes.....9

Table 7.8-1 Cost Estimates .....19

**LIST OF FIGURES**

Fig. 1-1. Sampling Locations at SWMU 11-001(c).....3

Fig. 5-1. Verification Sample Locations At SWMU 11-001(c).....11

## **1.0 INTRODUCTION**

This plan describes the proposed voluntary corrective action (VCA) at solid waste management unit (SWMU) 11-001(c) listed in Table A of the Hazardous and Solid Waste Amendments (HSWA) Module of Los Alamos National Laboratory's (LANL's) Resource Conservation and Recovery Act (RCRA) Part B Operating Permit (EPA 1990, 0306).

### **1.1 Site Type and Description**

SWMU 11-001(c) was a firing pit consisting of a 12.5 ft semicircular wall, 4.5 ft high, and constructed of 37-in. thick concrete. The former location of the firing pit is on the edge of Water Canyon, west of TA-16-370. Remnants of the foundation remain on the site.

#### **1.1.1 Operational History**

SWMU 11-001(c) is discussed in detail in subsection 5.16 of the RCRA Facility Investigation (RFI) work plan (LANL 1993 1094). No known documentation of the precise use and dates of use of this firing pit has been found.

Because of the uncertain history of SWMU 11-001(c), samples were collected and analyzed for metals, high explosives (HE) and their byproducts, and for natural and depleted uranium (used to simulate weapons geometry in documented K-Site experiments).

#### **1.1.2 Contaminants of Potential Concern and Rationale for Proposed Remedial Action**

SWMU 11-001(c) was sampled to determine if surface soil contained HE or uranium at levels of concern. The only contaminant identified at the site during RFI sampling was arsenic. Asbestos, possibly transite, was visually identified during sampling activities. Military debris, including at least one detonator, still remain at the site.

A VCA is proposed to remove debris, asbestos, and contaminated soil from the SWMU boundary using a vacuum system. The debris removal will be limited to items that appear to be firing site debris and piles of material. This remediation will be performed as a best management practice (BMP).

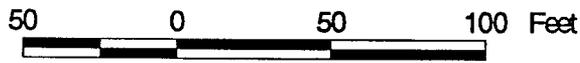
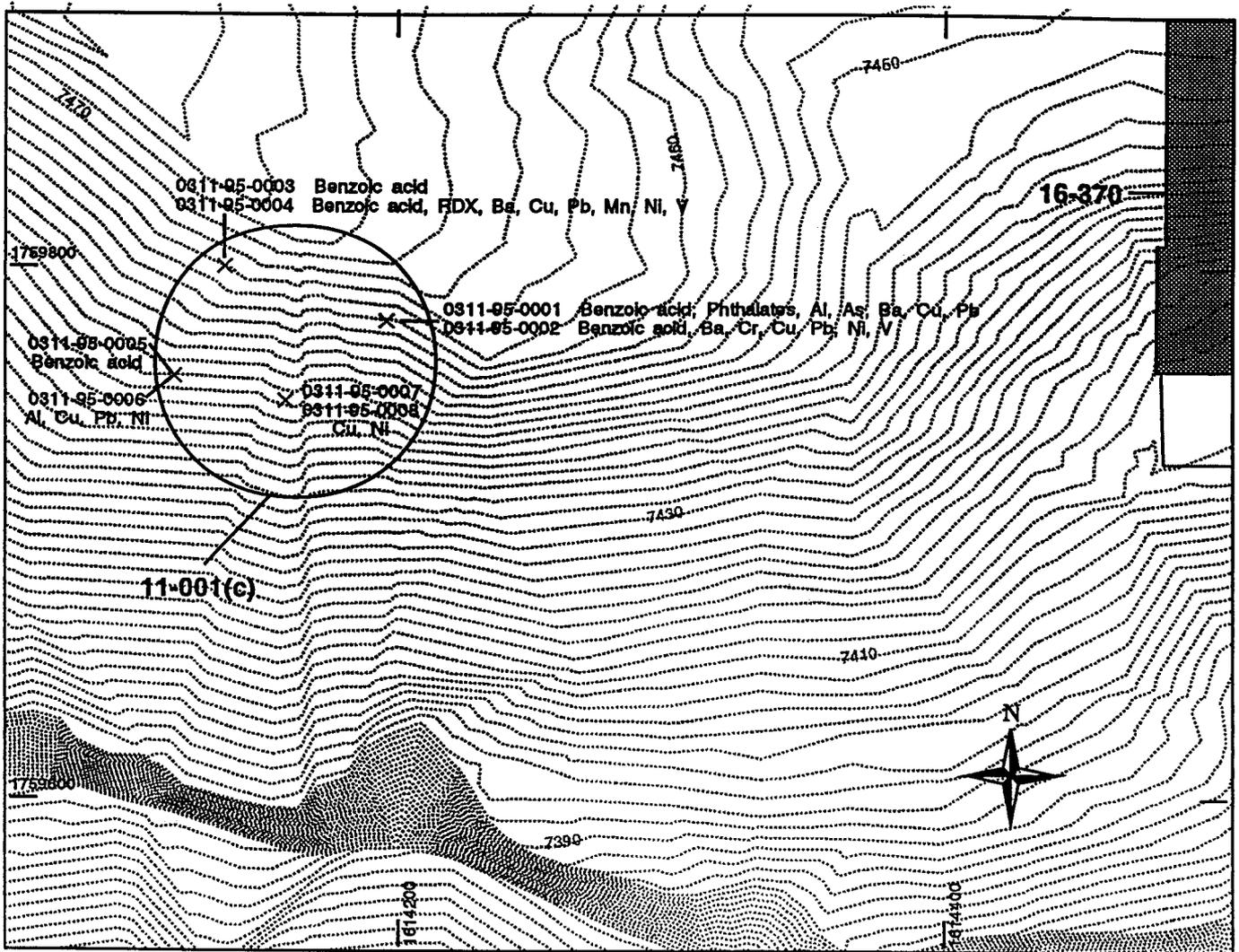
**2.0 SITE CHARACTERIZATION**

RFI sampling was performed between September 19 and September 22, 1995. The field activities implemented at the site included selection of sampling locations, land, geophysical, and screening surveys, and field sampling activities.

**2.1 RFI Information/Other Decision Data**

**2.1.1 Field Investigation for SWMU 11-001(c)**

Sampling at SWMU 11-001(c) consisted of four hand-augered cores; one selected from each quadrant of the site. Cores were augered into the soil/tuff interface. Two samples were collected from each core hole, the 0-18 in. deep section and either the 6 in. section above the soil/tuff interface or the 6 in. section at the bottom of the core. The surface sample was collected with a spade or scoop, the deeper sample with a hand auger. One location (11-0001) was biased to the presence of a detonator. These samples were submitted for laboratory analysis and are summarized below in Table 2.1-1. Figure 1-1 shows the sampling locations.



- X Sample location
- Permanent building
- Contours - 2 foot

Analytes listed exceed background levels.  
Abbreviations:

- |               |              |
|---------------|--------------|
| RDX-Cyclonite | Cu-Copper    |
| Al-Aluminum   | Mn-Manganese |
| As-Arsenic    | Ni-Nickel    |
| Ba-Barium     | Pb-Lead      |
| Cr-Chromium   | V-Vanadium   |

Fig. 1-1. Sampling locations at SWMU 11-001(c).

**TABLE 2.1-1  
SAMPLE DEPTHS AND LOCATIONS**

SAMPLE ID	LOCATION ID	LOCATION DESCRIPTION	DEPTH (in.)
0311-95-0001	11-0001	NE edge of pit, on lip	0 to 6
0311-95-0002 <sup>a</sup>	11-0001	NE edge of pit, on lip	6 to 11
none	11-0001	soil/tuff interface	8
0311-95-0003	11-0002	NW corner of pit, on lip	0 to 4
0311-95-0004 <sup>a</sup>	11-0002	NW corner of pit, on lip	5 to 8
none	11-0002	soil/tuff interface	7
0311-95-0005	11-0003	SW corner of pit, below lip	0 to 6
0311-95-0006 <sup>a</sup>	11-0003	SW corner of pit, below lip	6 to 11
none	11-0003	soil/tuff interface	9
0311-95-0007 <sup>a</sup>	11-0004	SE corner of pit, below lip	6 to 12
0311-95-0008 <sup>a</sup>	11-0004	SE corner of pit, below lip	12 to 16
none	11-0004	soil/tuff interface	13

<sup>a</sup>= sampled using a hand auger

All samples were screened for radioactivity and HE; all results were negative. All samples were also screened for volatile organic compounds (VOCs) using a photoionization detector (PID). These screening results are located in Table 2.1-2. It is likely that the PID readings are due to organic constituents naturally present in soil.

**TABLE 2.1-2  
SCREENING RESULTS FOR VOCs**

SAMPLE ID	LOCATION ID	SCREENING RESULT (ppm)
0311-95-0002	11-0001	5.0
0311-95-0003	11-0002	1.2
0311-95-0005	11-0003	0.8
0311-95-0006	11-0003	3.0
0311-95-0007	11-0004	1.5
0311-95-0008	11-0004	6.0

Table 2.1-3 lists the analytical request numbers for samples collected at SWMU 11-001(c).

**TABLE 2.1-3**  
**SUMMARY OF ANALYTICAL REQUEST NUMBERS FOR SAMPLES COLLECTED AT**  
**SWMU 11-001(c)**

LOCATION ID	SAMPLE ID	DEPTH (ft)	MATRIX	SVOCs <sup>a</sup>	METALS	TOTAL URANIUM	HE
11-0001	0311-95-0001	0-0.5	Soil	1192	1193	1194	1192
11-0001	0311-95-0002	0.5-1	Soil	1192	1193	1194	1192
11-0002	0311-95-0003	0-0.3	Soil	1192	1193	1194	1192
11-0002	0311-95-0004	0.3-0.7	Soil	1192	1193	1194	1192
11-0003	0311-95-0005	0-0.5	Soil	1192	1193	1194	1192
11-0003	0311-95-0006	0.5-1	Soil	1192	1193	1194	1192
11-0004	0311-95-0007	0.5-1	Soil	1192	1193	1194	1192
11-0004	0311-95-0008	1-1.3	Soil	1192	1193	1194	1192

<sup>a</sup> SOVCs = Semivolatile organic compounds.

2.1.2 Background Comparison

Radionuclides were not analyzed at SWMU 11-001(c).

Arsenic was found at a level above upper tolerance limits (UTLs) in one surface sample. Other inorganics were also present at levels greater than UTLs, as listed in Table 2.1-4. Figure 1-1 shows the locations of inorganics above UTLs.

**TABLE 2.1-4  
INORGANICS WITH CONCENTRATIONS GREATER THAN BACKGROUND UTLs FOR  
SWMU 11-001(c)**

SAMPLE ID	DEPTH (ft)	SOIL/ROCK UNIT	ALUMINUM (mg/kg)	ARSENIC (mg/kg)	BARIIUM (mg/kg)	CHROMIUM (mg/kg)	COPPER (mg/kg)
LANL UTL (all soil)	N/A <sup>a</sup>	N/A	38 700	7.82	315	19.3	15.5
LANL UTL (Qbt4)	N/A	N/A	6 200	2	42	5.4	1.6
SAL <sup>b</sup>	N/A	N/A	77 700	NC <sup>c</sup>	5 300	210	2 800
0311-95-0001	0-0.5	Soil	12 300	21.2	171	10.3	19
0311-95-0002	0.5-1	Qbt4	5 890	6.5	127	5.7	8.5
0311-95-0004	0.3-0.7	Qbt4	3 530	0.84	59.3	3.5	3.5
0311-95-0006	0.5-1	Qbt4	6 960	1.7	26.2	4.1	4
0311-95-0008	1-1.3	Qbt4	5 320	0.95	24.6	3	3.9

SAMPLE ID	DEPTH (ft)	SOIL/ROCK UNIT	LEAD (mg/kg)	MANGANESE (mg/kg)	NICKEL (mg/kg)	VANADIUM (mg/kg)
LANL UTL (all soil)	N/A <sup>a</sup>	N/A	23.3	714	15.2	41.9
LANL UTL (Qbt4)	N/A	N/A	4	370	<2	9.5
SAL <sup>b</sup>	N/A	N/A	400	NC	1 530	540
0311-95-0001	0-0.5	Soil	40.2	176 (J- <sup>d</sup> )	8.5 (J+ <sup>e</sup> )	23.6
0311-95-0002	0.5-1	Qbt4	12.8	249 (J-)	5.8 (J+)	15.9
0311-95-0004	0.3-0.7	Qbt4	11.4	407 (J-)	2.4 (J+)	10.8
0311-95-0006	0.5-1	Qbt4	9.3	143 (J-)	3.4 (J+)	9.1
0311-95-0008	1-1.3	Qbt4	3	176 (J-)	3.4 (J+)	6.1

<sup>a</sup> N/A = Not analyzed.

<sup>b</sup> SAL = Screening action level.

<sup>c</sup> NC = Not calculated.

<sup>d</sup> J- = Analyte is present. Concentration reported is an estimated value, with a low bias.

<sup>e</sup> J+ = Analyte is present. Concentration reported is an estimated value, with a high bias.

### 2.1.3 Evaluation of Organics

RDX, a high explosive, was present in sample 0311-95-0006 at a level of 0.414 mg/kg, a level significantly below the SAL of 4 mg/kg (Table 2.1-5). Phthalates were present at low levels in several samples. However, one of the phthalates was present in the method blank as a laboratory contaminant. Phthalates are widely used as plasticizers and are a common contaminant in laboratory analysis. Figure 1-1 shows the locations of organics above EQLs.

**TABLE 2.1-5  
SWMU 11-001(c) SOIL CONCENTRATIONS FOR ORGANIC ANALYTES WITH VALUES  
GREATER THAN DETECTION LIMITS**

SAMPLE ID	DEPTH (ft)	BENZOIC ACID (mg/kg)	BIS (2-ETHYLHEXYL) PHTHALATE (mg/kg)	DI-N-BUTYL PHTHALATE (mg/kg)	RDX (mg/kg)
SAL	N/A <sup>a</sup>	100 000	32	6 500	4.0
EQL <sup>b</sup>	N/A	3.3	0.33	0.33	1.0
0311-95-0001	0-0.5	0.16 (J) <sup>c</sup>	N/A	0.1 (J)	0.176 (U)
0311-95-0001DL <sup>d</sup>	0-0.5	N/A	9.8 (B) <sup>e</sup>	N/A	N/A
0311-95-0002	0.5-1	0.12 (J)	3 (U) <sup>f</sup>	0.35 (U)	0.175 (U)
0311-95-0003	0-0.3	0.085 (J)	1.7 (U)	0.37 (U)	0.174 (U)
0311-95-0004	0.4-0.7	0.06 (J)	1.8 (U)	0.36 (U)	0.174 (U)
0311-95-0005	0-0.5	0.089 (J)	1 (U)	0.36 (U)	0.175 (U)
0311-95-0006	0.5-1	3.6 (U)	0.67 (U)	0.36 (U)	0.414

a N/A=Not applicable.

b EQL=Estimated quantitation limit

c J = Analyte is present. Concentration reported is an estimated value.

d These are the analytical results for sample 0311-95-0001 after dilution and reanalysis.

e B = Analyte was found in associated method blank.

f U = Analyte was not detected.

## 3.0 PROPOSED REMEDY

### 3.1 Description of the Proposed Remedial Action

Proposed remedial activities will consist of removing: 1) asbestos, 2) firing site debris, especially in the area east of the pit, and 3) soil and debris in the area of the high arsenic value.

Chunks of asbestos present at the site will be removed and disposed of. The entire SWMU area will be visually inspected and material that looks like military debris will be picked up and disposed of. The debris cleanup will focus on the area east of the former firing pit foundations where it appears that firing debris bulldozed off the firing pad accumulated. Piles of debris and partially buried pieces of debris were seen in this area.

Phase I investigation indicated that 21 ppm of arsenic was present at the 0-6 inch depth of sampling location 11-0001. The area around this location appears to have a different soil than the soils covering the rest of the site. This unique soil may have been due to the bulldozing of debris or it may be industrial fill. The unique soil surrounding sampling location 11-0001 will be removed using suction equipment to a depth of 6 inches or until the native soil or tuff is visible. Debris present in this area will be removed in the process of removing soil.

### **3.2 Basis for Cleanup Levels**

The chemicals of potential concern (COPCs) to be considered during VCA planning are identified by a screening assessment that uses the results of the Phase I investigation at this site. The screening assessment, which is based on simple comparisons of site-specific analytical results with background and SALs, insures that the VCA of this site will focus on the COPCs. Only those chemicals present in concentrations greater than their SALs, or greater than the background UTL value in cases where no SAL is available, have calculated cleanup levels. Based on the results of the screening assessment for SWMU 11-001(c), the only COPC identified is arsenic, detected at a maximum concentration of 21 mg/kg. A soil cleanup level for arsenic has been established at 24 mg/kg for this VCA.

The soil cleanup level of 24 mg/kg for arsenic is based on human health risks using an industrial land-use exposure scenario. The equations and parameter values used in the calculation are identical to those specified in the Environmental Protection Agency (EPA) Region IX Preliminary Remediation Goal (PRG) Tables for industrial land use (EPA 1995, 1307) with the exception that the target lifetime incremental cancer risk value for this carcinogen has been set at 1 in 100 000. The cleanup values consider exposure pathways via soil ingestion, dust inhalation, and dermal absorption.

The target value for lifetime incremental cancer risk was increased from the value of 1 in 1 000 000 ( $10^{-6}$ ) used in EPA Region IX's PRG Tables to 1 in 100 000 ( $10^{-5}$ ) because this value lies at the midpoint of EPA's target risk range of  $10^{-6}$  to  $10^{-4}$ . A value above the lower end of the risk range is an appropriate choice at this site because: 1) the population

potentially exposed under the industrial land-use scenario at this secured and remote site is restricted to a relatively small number of workers who may perform maintenance activities near the area, and 2) a risk level of 1 in 1 000 000 results in a cleanup level (approximately 3 mg/kg) within the lower range of the background arsenic distribution for the soils at Los Alamos (the LANL UTL for all soils is 7.82 mg/kg).

### 3.3 Site Restoration

Following cleanup activities, the area of soil removal will be regraded and revegetated. Native grass seed will be used to revegetate the areas disturbed by remediation activities. The regraded area will be covered with jute matting to stabilize the slope and minimize erosion.

## 4.0 WASTE MANAGEMENT

### 4.1 Estimated Types and Volumes of Waste

Table 4.1-1 presents the types of waste expected and waste volume estimates.

**TABLE 4.1-1  
ESTIMATED WASTE TYPES AND VOLUMES**

ITEM	WASTE TYPE	ANTICIPATED VOLUME
Sampling waste and personal protective equipment	Nonhazardous/ nonradioactive	0.5 yd <sup>3</sup>
Contaminated soils	Nonhazardous/ nonradioactive	4 yd <sup>3</sup>
Asbestos	Regulated under the Toxic Substances Control Act	0.1 yd <sup>3</sup>
Decontamination water	Nonhazardous/ nonradioactive	30 gal.

#### **4.2 Method of Management and Disposal**

All waste will be managed in accordance with the appropriate regulations. Asbestos waste will be double bagged and disposed of at TA-54. All other waste is expected to be nonhazardous and nonradioactive. Secondary containment will be used for all liquid waste. No less than 90-day storage areas will be required.

#### **5.0 DESCRIPTION OF CONFIRMATORY/VERIFICATION SAMPLING**

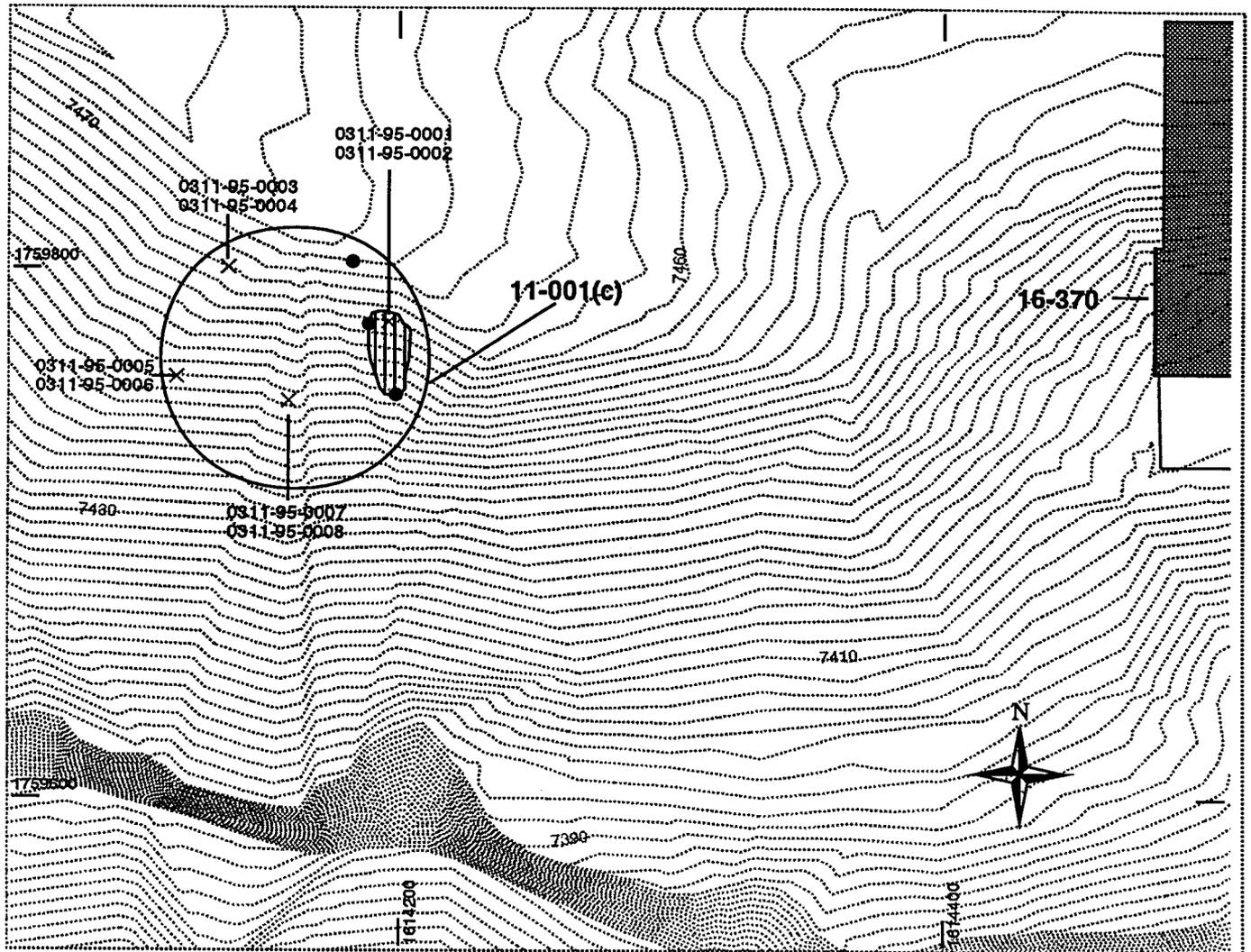
A total of five verification samples will be collected from SWMU 11-001(c). Three samples will be collected from areas where soil and/or debris was removed and two samples from random locations within the SWMU boundary where there was no soil or debris removal. Fig. 5-1 shows the locations of the confirmatory samples relative to the previously sampled locations.

Of the five verification samples, two samples will be collected at a depth of 0-6 in. from the area where the highest arsenic value was found. One sample will be collected near location 11-0001, and one sample will be collected downgradient from location 11-0001. Both of these samples are located in the area where soil and debris appear to have been pushed off the firing site pad. The third verification sample will be collected at the 6 - 12 in. depth from the east side of the firing pit. There appears to be some debris in this area and the area was not sampled during Phase I investigation. The fourth and fifth verification samples will be collected at a depth of 0-6 in. from random locations where there was no soil or debris removal.

All analytical results will be compared with the appropriate industrial cleanup levels.

#### **6.0 ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES**

The cleanup activities will require approximately three days to complete. The schedule could be affected by the results of the verification samples. If verification samples indicate more widespread contamination, further cleanup might be needed. Weather could also affect the schedule of cleanup activities.



50 0 50 100 Feet

- × Analytical sample location
- Verification sample location  
(2 additional random samples will be taken within the Potential Release Site)

-  Excavation boundary
-  Permanent building
-  Contours - 2 foot

Fig. 5-1. Verification sample locations at SWMU 11-001(c).

**7.0 ANNEXES**

**7.1 Risk-Based Cleanup Level Assumptions and Calculations**

See the Environmental Protection Agency (EPA) Region IX Preliminary Remediation Goal (PRG) Tables for industrial land use (EPA 1995, 53970) for specific calculations. See Section 3.2 of this document for assumption made in calculation.

**7.2 RFI Analytical Results**

Validated data are available in the Facility for Information, Management, Analysis and Display (FIMAD) or upon request.

**7.3 Implementation SOPs**

See Environmental Restoration Standard Operating Procedures, Volumes I and II, November 17, 1993, Los Alamos National Laboratory (LANL 1993, 0875).

**7.4 Quality Assurance Plan**

See Quality Program Plan and Quality Assurance Project Plan for Environmental Restoration, February 1995 revision, Los Alamos National Laboratory.

**7.5 Site-Specific Health and Safety Plan**

**THIS PAGE LEFT INTENTIONALLY BLANK**

**LANL ER PROJECT**  
**SITE-SPECIFIC HEALTH AND SAFETY PLAN (SSHASP)**

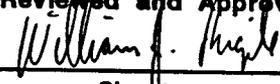
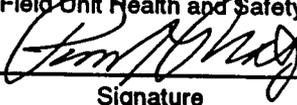
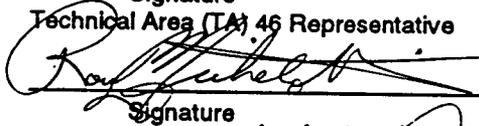
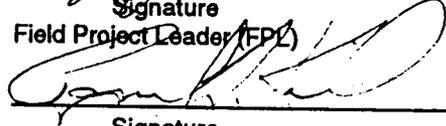
Project Title: VCA Work at PRS 11-001(c)

TA: 11

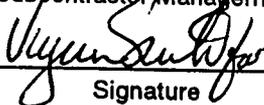
SSHASP: 136

This plan addresses the health and safety criteria to be followed during investigation, remediation or decommissioning activities associated with the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL)

**Reviewed and Approved by:**

	Bill Brazile/ESH Rep	ESH-5	8/21/96
Signature	Name/Title	Company	Date
Field Unit Health and Safety (HS) Representative			
	Pat LaFrata/HP	ESH-1	8-20-96
Signature	Name/Title	Company	Date
ESH-1 Representative			
	Bob Grace/TA-11 Rep.	LANL	8-16-96
Signature	Name/Title	Company	Date
Technical Area (TA) 46 Representative			
	Roy Micholotti <del>Brad Martin/PL</del>	CST-18	8-16-96
Signature	Name/Title	Company	Date
Field Project Leader (FPL)			
	Raymond L. Kidman/FTM	ICF KE	
Signature	Name/Title	Company	Date
FTM			

**Concurrence by:**

(See Next Page)	Clark Judy /Program Manager	MK	
Signature	Name/Title	Company	Date
Subcontractor Management or HS Representative			
	Ivan Wachler/ NM Operations H&S Officer	ICF KE	8/16/96
Signature	Name/Title	Company	Date
Subcontractor Management or HS Representative			

The comments of the above reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

David P. Dixon/	MK	M-892	662-7300
Plan Preparer Name/Signature	Group	Date	Mailstop Phone

**LANL ER PROJECT**  
**SITE-SPECIFIC HEALTH AND SAFETY PLAN (SSHASP)**

Project Title: VCA Work at PRS 11-001(c)

TA: 11

SSHASP: 136

This plan addresses the health and safety criteria to be followed during investigation, remediation or decommissioning activities associated with the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL)

**Reviewed and Approved by:**

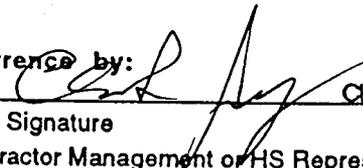
	<u>Bill Brazile/ESH Rep</u>	<u>ESH-5</u>	
Signature	Name/Title	Company	Date
Field Unit Health and Safety (HS) Representative			

	<u>Pat LaFrate/HP</u>	<u>ESH-1</u>	
Signature	Name/Title	Company	Date
ESH-1 Representative			

	<u>Bob Grace/TA-11 Rep.</u>	<u>LANL</u>	
Signature	Name/Title	Company	Date
Technical Area (TA) 46 Representative			

	<u>Brad Martin/FPL</u>	<u>CST-18</u>	
Signature	Name/Title	Company	Date
Field Project Leader (FPL)			

	<u>Raymond L. Kidman/FTM</u>	<u>ICF KE</u>	
Signature	Name/Title	Company	Date
FTM			

<b>Concurrence by:</b>			
	<u>Clark Judy /Program Manager</u>	<u>MK</u>	<u>8-15-96</u>
Subcontractor Management or HS Representative	Name/Title	Company	Date

	<u>Ivan Wachler/ NM Operations H&amp;S Officer</u>	<u>ICF KE</u>	
Signature	Name/Title	Company	Date
Subcontractor Management or HS Representative			

The comments of the above reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

<u>David P. Dixon/</u>	<u>MK</u>	<u>M-892</u>	<u>662-7300</u>
Plan Preparer Name/Signature	Group	Date	Mailstop Phone

## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 Introduction .....	1-1
2.0 Background Information .....	2-1
Table 2-1 Project Description.....	2-1
Table 2-2 Site Description(s) .....	2-2
Table 2-3 Scope of Work.....	2-6
3.0 Organization, Responsibilities and Authority.....	3-1
Table 3-1 Key Personnel Having HS Responsibility .....	3-1
4.0 Hazard Analysis.....	4-1
Table 4-1 Project Personnel by Task.....	4-1
Table 4-2 Hazard Substances of Occupational Health Concern .....	4-2
Table 4-3 Hazard Assessment and Administrative/Engineering Controls .....	4-4
5.0 Site Controls 5-1	
Table 5-1 Site Control Measures.....	5-1
6.0 Exposure Monitoring and Corresponding Actions .....	6-1
Table 6-1 Direct-Reading Instrument Requirements.....	6-1
Table 6-2 Personal Dosimetry Requirements.....	6-4
7.0 Personal Protective Equipment (PPE) .....	7-1
Table 7-1 PPE Requirements.....	7-1
8.0 Decontamination .....	8-1
Table 8-1 Personnel and Equipment Decontamination.....	8-1
9.0 Emergency/Incident Action Plan .....	9-1
Table 9-1 Emergency/Incident Action Requirements .....	9-1
10.0 Training .....	10-1
Table 10-1 Training Requirements .....	10-1
11.0 Medical Surveillance.....	11-1
Table 11-1 Medical Surveillance Requirements .....	11-1
12.0 Quality Control and Quality Assurance (QC/QA).....	12-1
Table 12-1 Inspection Requirements.....	12-1
13.0 Recordkeeping .....	13-1
Table 13-1 Recordkeeping Requirements.....	13-1
 <b><u>Appendices</u></b>	
A Map(s) of Site Locations.....	A-1
B Hazardous Substance - Hazard Assessment.....	B-1
C Chemical, Physical, and Toxicological Reference Materials .....	C-1
D Emergency Contacts and Route(s) to Medical Services .....	D-1
E Hazardous Substances Exposure Calculations.....	E-1

## LIST OF ACRONYMS and ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
AL	Action Level
AR	Administrative Requirements
ATM	Atmosphere
°C	Degrees Centigrade
CFR	Code of Federal Regulations
COPCs	Contaminants of Potential Concern
CP	Competent Person
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
DAC	Derived Air Concentration
dBA	Decibels (A-Weighted Scale)
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ESH	Environmental, Safety and Health
ESH-1	Health Physics Operations Group
ESH-2	Occupational Medicine Group
ESH-5	Industrial Hygiene and Safety Group
ESH-12	Policy and Program Analysis Group
eV	Electron Volts
EZ	Exclusion Zone
°F	Degrees Fahrenheit
FPL	Field Project Leader
FTL	Field Team Leader
FTM	Field Team Manager
GET	General Employee Training
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HPT	Health Protection Technician
HS	Health and Safety
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life or Health
IHT	Industrial Hygiene Technician
IP	Ionization Potential
LAMC	Los Alamos Medical Center
LANL	Los Alamos National Laboratory
LEL	Lower Explosive Limit
ug/m <sup>3</sup>	Micrograms Per Cubic Meter

mg/m <sup>3</sup> .....	Milligrams Per Cubic Meter
mm.....	Millimeters
MSDS.....	Material Safety Data Sheet
MUC.....	Maximum Use Concentration
NIOSH.....	National Institute for Occupational Safety and Health
NRR.....	Noise Reduction Rating
OSHA.....	Occupational Safety and Health Administration
PAH.....	Polycyclic Aromatic Hydrocarbons
PEL.....	Permissible Exposure Limit
PF.....	Protection Factor
PID.....	Photoionization Detector
PNA.....	Polynuclear Aromatics
PPE.....	Personal Protective Equipment
PRS.....	Potential Release Site
RCT.....	Radiological Control Technician
RMMA.....	Radioactive Materials Management Area
RSAA.....	Radiological Surveillance Authorization Agreement
RSP.....	Radiological Screening Personnel
RWP.....	Radiological Work Permit
SC.....	Spill Containment
SLM.....	Sound Level Meter
SOP.....	Standard Operating Procedures
SSHASP.....	Site-Specific Health and Safety Plan
SSO.....	Site Safety Officer
SUP.....	Supervisor
SWMU.....	Solid Waste Management Unit
SWP.....	Special Work Permit
SZ.....	Support Zone
TA.....	Technical Area
TLD.....	Thermoluminescent Dosimeter
TLV.....	Threshold Limit Value
TWA.....	8-Hour Time-Weighted Average
UST.....	Underground Storage Tank
VCA.....	Voluntary Corrective Action

## 1.0 INTRODUCTION

This Site-Specific Health and Safety Plan (SSHASP) has been developed for the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL) to comply with applicable federal and state occupational health and safety (HS) requirements, including those of the U.S. Department of Energy (DOE). The DOE requires LANL to comply with the federal Occupational Safety and Health Administration (OSHA) requirements, although operations at LANL are not subject to the jurisdiction of OSHA. The ER Project has developed a generic Health and Safety Plan, the ER Project HASP, which establishes HS information and requirements applicable to ER field operations projectwide. In addition to the HASP, this SSHASP establishes site-specific HS information and requirements applicable to the project described in Section 2.

ER participants are responsible for conducting work in accordance with applicable regulations. The term "ER participants" refers to anyone performing ER work, including LANL, subcontractors to LANL and their lower-tier contractors, consultants, and agents. In some cases in this document, LANL has chosen to invoke OSHA and LANL requirements which ordinarily may not apply to ER field operations (e.g., OSHA's general industry standards in Part 1910 of Title 29 of the Code of Federal Regulations [29 CFR 1910]). These choices were made on a case-by-case basis to maintain consistency with LANL's ALARA policy and to clarify LANL's expectations with regard to interpretable requirements of the multiple agencies governing ER work. Where there is concern that implementation of work orders or HS requirements would conflict with contract terms, or could unreasonably compromise the safety or health of an individual or the environment, such concerns should be brought to the attention of the Contract Administrator and the Field Unit HS Representative immediately. Failure to comply with terms of HS plans may constitute cause to stop activity or for issuance of a stop work order as specified in Section 3.4.2 of the HASP without cost or penalty to LANL.

This SSHASP shall be reviewed and approved in accordance with Section 1.2 of the HASP. Once this SSHASP has been approved, revisions will be tracked using a SSHASP modification form (Appendix B of the HASP) per Section 1.3 of the HASP. Modifications to this SSHASP may result in a change to the terms or scope of a subcontract. Completion of a SSHASP modification form is not the means for modifying the scope or terms of the project contract. To modify a contract, the Subcontractor shall notify the Contract Administrator and Field Unit HS Representative under the changes clause and shall not proceed with the change until a change order has been mutually agreed between the parties, or unless unilateral direction is given by the Contract Administrator.

This SSHASP shall assess the Voluntary Corrective Action (VCA) located at site 11-001(c). Site 11-001(c) was a firing pit consisting of a 12.5 ft. semicircular wall, 4.5 ft. high, and constructed of 37 in. thick concrete. The structure is located on the edge of Water Canyon, west of Building TA-16-370. Remnants of this building's (TA-16-370) foundation remain on site. The remediation action is to remove transite asbestos fragments present in the soil, remove firing site debris especially in the area east of the pit, and removal of soil and debris in the area found to have high arsenic content. The means of cleaning-up the site will be physical collecting debris and by utilizing a vacuum excavation device. Once the cleanup goals have been met, the site will be regraded and stabilized. This SSHASP describes the associated hazards to completing this activity and appropriate control measures to mitigate most of these hazards.

## 2.0 BACKGROUND INFORMATION

Provided in this section is the site specific background information for this project in accordance with Section 2 of the HASP. The project title, location, and objective as well as the classification and type of work are provided in Table 2-1. The site description and scope of work are provided in Tables 2-2 and 2-3 respectively.

<b>TABLE 2-1 PROJECT DESCRIPTION</b>
This table provides the project title, location, and objective, and the classification and type of work to be performed for which this SSHASP has been developed.
<b>Project Title:</b> VCA 11-001(c)
<b>Project Location:</b> TA-11, Near foundation remnants of TA-16-370.
<b>Project Objective:</b> Site remediation and restoration
<b>Classification of Work:</b> Voluntary Corrective Action (VCA).
<b>Type of Work:</b> NON-INTRUSIVE - Remediation by physically collecting visual materials. INTRUSIVE - Remediation with a vacuum excavation system and/or shallow trenching with shovels.

**TABLE 2-2  
SITE DESCRIPTION(S)**

This table identifies the characteristics and contaminants of potential concern (COPCs) for the site to be remediated at Technical Area (TA) 11. Atop the column is the VCA where work under this SSHASP will be performed

11-001(c)	
DESCRIPTOR	CHARACTERISTICS
<b>GENERAL SITE CONDITIONS</b>	
<b>Adj. Fac./Struct.</b>	There are roads, buildings and structures associated with this PRS.
<b>Below Ground Utilities</b>	No underground utilities are identified.
The excavation permit, required to be issued prior to initiating this remediation activity, should specifically identify the type of below ground utilities in the area of operation.	
<b>Above Ground Elect.</b>	No above ground utilities should be impacted by this operation.
<b>Topography</b>	This VCA is located on a mesa top at the edge of Water Canyon.
<b>Pathways for Release/Dispersion</b>	The pathways of uncontrolled release dispersion at this VCA is by land and air (East and West).
<b>Emergency Access</b>	The emergency accessibility to this VCA is by land.
<b>Previous Fac. Ops</b>	This VCA was a firing site.
<b>Previous Info./ Data</b>	Knowledge of Process and Historical Review.
<b>PREVIOUS SUBSTANCES USED, DISPOSED, DETECTED OR SUSPECTED</b>	
<b>CHEMICALS: (VOC &amp; SVOC)</b>	
Benzoic Acid	X
Bis(2-ethylhexyl)phthalate	X
Di-n-butylphthalate	X
<b>METALS</b>	
Aluminum	X
Arsenic	X
Barium	X
Chromium	X
Copper	X
Lead	X
Manganese	X
<b>HE</b>	
RDX	X
<b>MISCELLANEOUS</b>	
Asbestos	X
<b>RADIONUCLIDES</b>	
Not analyzed not expected	X

**TABLE 2-3  
SCOPE OF WORK**

This table describes the tasks to be performed during the VCA at TA-11-001(c). The anticipated dates/duration of work by month are presented for the task.

<b>Task ID</b>	<b>Task Description</b>	<b>VCA</b>	<b>Dates</b>
<b>Task 1 Site Prep.</b>	This task involves the set up and removal of site control boundaries, equipment and supplies.		<b>August 1996 Through September 1996</b>
<b>Task 2 Remediation</b>	This task involves the use of physical labor to collect debris and a vacuum excavation system and/or shovels to excavate the contaminated soil. The IH and Rad monitoring requirements specified in Section 6 of this SSHASP shall be performed during this task.		
<b>Task 3 Field Screening and Confirmation Sampling</b>	This task involves the collection of soil samples for analysis with an XRF portable detector and collection of confirmation samples for off-site analysis. The IH and Rad monitoring shall be conducted as a precautionary step. Radiological contamination was not determined to occur at this PRS. Specific monitoring as specified in Section 6 of this SSHASP shall be performed during this task.		
<b>Task 4 Decon.</b>	This task involves the use of water and soap solution to decontaminate personnel, vacuum and environmental monitoring equipment (EME), and hand tools used in the exclusion zone as specified in Section 6 of this SSHASP. The IH monitoring requirements specified in Section 6 of this SSHASP shall be performed during this task.		
<b>Task 5 Restoration</b>	This task involves the use of shovels and other hand tools to regrade and stabilize the excavated area.		
<b>Task 6 Incident Response</b>	This task involves the response to incidents that may occur as a result of the site remediation activities occurring at TA- 11. Incidents may include: Rendering first-aid/CPR, making appropriate notifications, using a fire extinguisher to fight incipient fires, evacuation, and assisting emergency care providers as necessary. Hazardous substance release and spill containment are not part of this task since release of hazardous substances is not expected.		

### 3.0 ORGANIZATION, RESPONSIBILITIES, AND AUTHORITY

Provided in this section are the key personnel having health and safety (HS) responsibilities for this project in accordance with Section 3 of the HASP. Definition of HS roles, responsibilities, authorities, and lines of communication for key personnel identified in Table 3-1 are defined in Section 3 of the HASP.

<b>TABLE 3-1 KEY PERSONNEL HAVING HS RESPONSIBILITY</b>			
This table provides the title, name organization and phone/pager number for each of the key personnel having health and safety (HS) responsibilities for the VCA at TA-11-001(c)			
<b>FACILITY CONTACTS</b>			
TA 11 Facility Rep.	Bob Grace	LANL	667-5011
<b>FIELD PROJECT MANAGEMENT</b>			
Field Project Leader (FPL)	Brad Martin	LANL	667-6080
Alternate FPL	Roy Michelotti	LANL	665-7444
Field Team Manager	Lynn Kidman	ICF	661-5227
<b>FIELD TEAM MEMBERS</b>			
Field Team Leader (FTL)	Linda Fluk	ICF	661-5229
SSO level II (minimum)	Dave Dixson (level III)	MK	662-7300
RSP	Dave Dixson	MK	
<b>SUPPORT PERSONNEL</b>			
ESH-5 Rep.	Bill Brazile	LANL	665-5128
ESH-1 Rep.	Marty Peifer	LANL	667-0083
Subcont. HS/Mgt. Rep.	Ivan Wachler	ICF	661-5211
Subcont. HS/Mgt. Rep.	Clark Judy	MK	662-7300
<b>ALTERNATE PERSONNEL</b>			
SSO	Ken McFadden (level III) Bob Staub (level III)	MK	662-7300
Health Physics Support	Rich Baker (RCT)	ICF	661-5217

#### 4.0 HAZARD ANALYSIS

Provided in this section are the task-specific hazard analysis information and requirements for this project in accordance with Section 4 of the HASP. The project personnel, by role, expected to perform the tasks identified in Table 2-3, are identified in Table 4-1. Substances having a hazard assessment resulting in either "possibly could occur", "probably will occur", or "likely to occur" and which are expected to result in injury or illness having a hazard severity of "minor", "major", or "catastrophic" are considered to pose an occupational health threat to personnel who may be exposed to these substances, and are included in Table 4-2. The hazard assessment and administrative and engineering controls for the safety hazards and health concerns and the most hazardous substances are identified in Table 4-3.

<b>TABLE 4-1</b>						
<b>PROJECT PERSONNEL BY TASK</b>						
This table identifies the personnel, by role, who are expected to perform the task(s) indicated. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response						
PERSONNEL ROLE	TASK(s)					
	1	2	3	4	5	6
FTL	X	X	X	X	X	X
SSO (level II, or III)	X	X	X	X	X	X
RSP		X	X	X	X	
HPT (or RCT)	HPT's (or an RCT) shall be required for "free release" surveys that may be needed if the Health Physics action levels listed in Table 6-2 are exceeded.					
Laborers	X	X	X	X	X	X
Vacuum operator		X				

**TABLE 4-2  
HAZARDOUS SUBSTANCES OF OCCUPATIONAL HEALTH CONCERN**

Not all chemical products used to accomplish these tasks or contaminants at the VCA pose an occupational health threat. A health hazard assessment of each chemical product and site contaminant identified in Table 2-2 was performed using the hazard assessment method provided in Appendix C of the HASP. The results of the health hazard assessment and associated rationales are provided in Appendix B

This table identifies those hazardous substances (i.e., chemical products and site contaminants) that are considered to pose an occupational health threat to personnel who may be exposed to these substances while performing the indicated tasks.

The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

(N = Negligible, MI = Minor)

**Hazardous Chemical Products to be Used During Field Operations**

The chemical products listed below are likely to be used, for the tasks indicated, onsite or at satellite locations where field support operations occur. MSDSs for each product brought on site shall be kept readily available to users of these products, and shall be shared with other employer's employees onsite who may be affected by the hazardous products in accordance with 29 CFR 1926.65(b)(1)(iv) and (v) and 1926.65(i) and Section 4.2.2.3 of the HASP. It is LANL's policy that whenever feasible a less toxic product should be substituted for a more toxic product, especially for products having a carcinogen constituent.

HAZARDOUS SUBSTANCE	TASK(s)					
	1	2	3	4	5	6
<b>CHEMICAL PRODUCTS</b>						
CALIBRATION GASES	None of Occupational Health Concern (refer to Appendix B).					
FUELS/LUBRICANTS	None of Occupational Health Concern (refer to Appendix B).					
RDX FIELD SCREENING KIT	None of Occupational Health Concern (refer to Appendix B).					
<b>SITE CONTAMINANTS</b>						
<b>CHEMICALS</b>						
Benzoic Acid	N	MI	MI	MI	N	N
Bis(2-ethylhexyl)phthalate	N	MI	MI	MI	N	N
Di-n-butylphthalate	N	MI	MI	MI	N	N
<b>METALS</b>						
Aluminum	N	MI	MI	MI	N	N
Arsenic	N	MI	MI	MI	N	N
Barium	N	MI	MI	MI	N	N
Chromium	N	MI	MI	MI	N	N
Copper	N	MI	MI	MI	N	N
Lead	N	MI	MI	MI	N	N
Manganese	N	MI	MI	MI	N	N
HE						
RDX	N	N	N	N	N	N
<b>MISCELLANEOUS</b>						
Asbestos	N	MI	MI	MI	N	N
<b>RADIONUCLIDES</b>						
None Noted at VCA	None of Occupational Health Concern since none detected in sample analysis.					

**TABLE 4-3  
HAZARD ASSESSMENT and ADMINISTRATIVE and ENGINEERING (A&E) CONTROLS**

This table identifies those hazards expected to result in one of the hazard assessment ratings defined below and could pose an occupational health threat to workers performing the associated task(s). The hazard assessments and rationales are also indicated with the corresponding administrative and engineering controls for protection from and mitigation of the hazards. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

Hazard	Task(s)	Hazard Assessment	Hazard Assessment Rationale	Administrative & Engineering Controls (Prevention/Mitigation Measures)
<b>Safety Hazards and Health Concerns</b>				
<b>VACUUM EQUIPMENT OPERATION</b>	EXCAVATION PERMIT REQUIRED for removing or assessing soils at depth $\geq$ 12 inches; A&E controls shall be implemented in accordance with applicable LANL excavation permit (per LANL AR 1-12) and as specified below; contact Field Unit HS Representative to initiate permit process			
Underground utilities elec./fire/explosion hazards	1, 2, and 3	Minor to serious	Hazard severity could be catastrophic and although unlikely to occur, possibly could occur.	Estimated locations of utilities (e.g., sewer telephone, gas, electric, water lines, etc.) shall be determined prior to vacuuming and/or shallow trenching. Notify utility owners of intended work and request they demarcate on ground surface location(s) of underground utilities; have a field team member accompany utility owner rep. to identify intended vacuum area and/or shallow trenching location(s) and to fill out specifics of utility location(s).
Overhead elec. hazard	2	Negligible	Unlikely that mishap will occur since vacuum does not pose a likely contact with overhead electrical lines.	During stationery operations, minimum clearance between live lines and any part of the equipment or load: 10 ft for lines rated 50 kV; 10 ft + 0.4 in. for each 1 kV over 50 kV, or twice the length of line insulator, whichever is greater.
Pinch points	2	Moderate	Hazard severity likely to be irreversible injury and possibly could occur	Heavy equipment shall be inspected for engineering controls in compliance with applicable sections of Subpart O of 29 CFR 1926 and 1910
<b>Physical Hazards and Health Concerns</b>				
Electrocution	2	Minor	Unlikely that mishaps would occur. If mishap occurs irreversible harm would arise.	Take preventative measures and identify and correct deficiencies in accordance with Subpart K of 29 CFR 1926 and Section 4.2.2.1 and/or 4.2.2.8 of the HASP, as applicable.
Excessive Noise	2	Moderate to Serious	Possibly or probably could occur resulting in irreversible hearing loss	Whenever voice(s) must be raised to communicate between two or more persons located $\leq$ 3 feet of each other noise level likely exceeding PEL; conduct noise monitoring per Section 6; also refer to Section 4.2.2.7 of HASP for additional requirements

**TABLE 4-3 (CONT.)**

**HAZARD ASSESSMENT and ADMINISTRATIVE and ENGINEERING (A&E) CONTROLS**

The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

<b>Hazard</b>	<b>Task(s)</b>	<b>Hazard Assessment</b>	<b>Hazard Assessment Rationale</b>	<b>Administrative &amp; Engineering Controls (Prevention/Mitigation Measures)</b>
Sanitation	All	Minor	Unsanitary working conditions could possibly pose "minor" injury/illness	Toilet and hand washing facilities at TA-11 will be used
Uneven terrain, slips, trips, falls	All	Minor	Uneven terrain, trip hazards and poor housekeeping could possibly pose "minor" injury/illness	Use caution and be observant while moving in areas of potential concern; minimize threat of slick surfaces; eliminate tripping hazards where appropriate; and practice good housekeeping.
<b>High Explosives (RDX)</b>				
High Explosives	All	Negligible	See Appendix B	Will conduct a visual field inspection for any visible signs of RDX and will field screening for RDX at site before excavation or vacuuming
<b>Biological Hazards and Health Concerns</b>				
General	All	Refer to Table 4.0 of the HASP for information concerning various general hazards associated with occupational exposure to toxic and/or hazardous biological agents.		
Hanta Virus	All	Negligible	Crew is not expected to work in areas that mice or rats inhabit. No visible signs of their presence has been observed.	Refer to Table 4 and Section 4.2.2.2 of the HASP.
Bloodborne Pathogens	6	Refer to Table 4 and Section 4.2.2.2 of the HASP.		
<b>Chemical, Metal, Miscellaneous and Radiological Hazards and Health Concerns</b>				
<b>CHEMICAL</b>				
Calibration Gases	2, 3, 4, and 5	Negligible	See Appendix B	Calibration gases shall be used in ventilated area.
Fuels/Lubricants	2	Negligible		Flammable/Combustible materials shall be stored in accordance with 29 CFR 1926.152. Vacuum shall not be refueled while the engine is running or in a spark-, or flame-producing environment.
HE Field Screening Kits	2	Negligible		Chemicals are in such small quantities requirements are not needed.
Airborne vapors from organics listed in Table 4-2	2, 3, 4,	Negligible to Minor		Compliance with 29 CFR 1926.55(b), 29 CFR 1926.57, and/or other applicable chemical-specific standard (Table 2 of the HASP).

**TABLE 4-3 (CONT.)**

**HAZARD ASSESSMENT and ADMINISTRATIVE and ENGINEERING (A&E) CONTROLS**

The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

**Chemical, Metal, Miscellaneous and Radiological Hazards and Health Concerns**

<b>METAL</b>				
Airborne dust from metals listed in Table 4-2	2,3,4	Negligible to Minor	See Appendix B	Airborne dust shall be suppressed by application of an amended water-based mist, as necessary, to keep levels below action levels in Section 6.
<b>MISCELLANEOUS</b>				
Airborne dust from Asbestos listed in Table 4-2	2,3,4	Negligible to Minor	See Appendix B	Airborne dust shall be suppressed by application of an amended water-based mist, as necessary, to keep levels below action levels in Section 6.
<b>RADIOLOGICAL</b>				
No radiological concerns				

## 5.0 SITE CONTROLS

Provided in this section are the required site control measures for this project in accordance with Section 5 of the HASP. The control measures are specified in Table 5-1 for each task or group of tasks having different requirements. Since some zone or facility locations may change as site work progresses due to daily variability in site conditions and/or operations (e.g., wind or access), actual locations are to be explained to field team members by the SSO, or the FTL during daily HS tailgate meetings and documented in the logbook kept by the SSO.

TABLE 5-1						
SITE CONTROL MEASURES						
This table identifies the control measures to be implemented during the tasks specified. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.						
CONTROL MEASURES	TASK(S)					
	1	2	3	4	5	6
<b>EXCLUSION ZONE (EZ)</b>						
Not applicable	X					X
Regulated Area		X	X	X	X	Per Table 3 of HASP.
Localized at work site		X	X	X	X	
Demarcated by cones, barrier tape, rope or similar material		X	X	X	X	Posting(s): Per Subpart G of 29 CFR 1926 and 29 CFR 1926.1101 (k) (7) (i) and (ii)
Radiological Control Area (RCA)/ Radioactive Material Management Area (RMMA)	The level of radiological contamination is expected to be below the level for a RCA/RMMA . If the action levels in Table 6-1 for radiation are exceeded, appropriate postings will be established by ESH-1 per the LANL Standard "Radiological Postings", LS 107-02.0					
<b>CONTAMINATION REDUCTION ZONE (CRZ)</b>						
Not applicable	X					X
Centralized location		X	X	X	X	
Demarcated by cones, barrier tape, rope or similar material		X	X	X	X	Posting(s): Per Subpart G of 29 CFR 1926.
RCA/ RMMA	The level of radiological contamination is expected to be below the level for a RCA/RMMA . If the action levels in Table 6-1 for radiation are exceeded, appropriate postings will be established by ESH-1 per the LANL Standard "Radiological Postings", LS 107-02.0.					
<b>SUPPORT ZONE (SZ)</b>						
Not applicable	X					X
Localized at work site		X	X	X	X	
<b>EQUIPMENT STAGING AREA</b>						
Not applicable	X					X
Located at work site in SZ		X				When vacuum is used.
Demarcation unnecessary			X	X	X	Posting(s): Per Subpart G of 29 CFR 1926.
<b>EQUIPMENT DECON PAD/FACILITY</b>						
Not applicable	X	X	X		X	X
Located at work site EZ				X		Posting(s): Per Subpart G of 29 CFR 1926.
RCA/RMMA	The level of radiological contamination is expected to be below the level for a RCA/RMMA . If the action levels in Table 6-1 for radiation are exceeded, appropriate postings will be established by ESH-1 per the LANL Standard "Radiological Postings", LS 107-02.0					

**TABLE 5-1 (Cont.)  
SITE CONTROL MEASURES**

The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

CONTROL MEASURES	TASK(S)					
	1	2	3	4	5	6
<b>TEMPORARY WASTE STORAGE AREA</b>						
Not applicable	X				X	X
Located onsite		X	X	X		
Demarcation unnecessary		X	X	X		
						Posting(s): Per Subpart G of 29 CFR 1926 and 29 CFR 1926.1101 (k) (7) and (8).
RCARMMA	The level of radiological contamination is expected to be below the level for a RCA/RMMA . If the action levels in Table 6-1 for radiation are exceeded, appropriate postings will be established by ESH-1 per the LANL Standard "Radiological Postings", LS 107-02.0.					
<b>SUPPORT TRAILER(S)/VEHICLES</b>						
Located at work site SZ	X	X	X	X	X	X
Demarcation unnecessary	X	X	X	X	X	X
						Posting(s): Per Subpart G of 29 CFR 1926.
<b>MOBILE LABORATORY</b>						
Not applicable	X	X	X	X	X	X
<b>HAND WASH FACILITY</b>						
Not Applicable	X					X
Located onsite in SZ		X	X	X	X	
						Posting(s): Per 29 CFR 1926.65 (n) or 1926.51 and Subpart G of 29 CFR 1926.
<b>TOILET FACILITY</b>						
Located at TA- 11	X	X	X	X	X	X
<b>CLOTHING CHANGE FACILITY</b>						
Not applicable	X					X
Located onsite in SZ		X	X	X	X	
Demarcation unnecessary		X	X	X	X	
						Posting(s): Per Subpart G of 29 CFR 1926, 29 CFR 1926.1101 (7)
<b>WIND DIRECTION INDICATOR(S)</b>						
Not applicable	X					X
Flag, ribbon, tape, or other suitable material		X	X	X	X	
						Located on-site where readily visible to field team members.

## 6.0 EXPOSURE MONITORING AND CORRESPONDING ACTIONS

This section specifies the requirements for exposure monitoring and corresponding actions for this project in accordance with section 6 of the HASP. Table 6-1 specifies the requirements for direct-reading instruments and Table 6-2 specifies the personal dosimetry requirements. Area sampling is not required for this project since no airborne hazardous substances are expected. In accordance with Section 6 and with the chemical-specific standards listed in Table 2 of the HASP, personnel exposure monitoring requirements, action levels, and the corresponding actions to be taken are specified in both tables for each task or group of tasks having different requirements.

TABLE 6-1 DIRECT-READING INSTRUMENT REQUIREMENTS							
This table identifies the direct-reading instrument requirements based on the hazardous condition/substance present and the task being performed. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.							
Hazardous Condition/ Substance	Task(s)	Instrument	Procedure	Location and Frequency of Monitoring	Action Level(s)	Response Action(s)	Action Level Rationale
<b>HEALTH PHYSICS</b>							
Radiation Gross a and gross-b/g cont. (specific radio- isotopes listed in Table 2-2)	2,3,4	b/g -Eberline ESP-1 with HP- 260 probe or equiv.	Per LANL RadCon Manual and training	Intrusive activities: Ground surface prior to disturbance, and excavated soil/material	Background	Field team member trained in ESH-1 procedures performs surveys (soil, core, personnel, etc.) Intermittent ESH-1 coverage Large area swipes for a (2000 cm <sup>2</sup> ) counted using field alpha screening instrument; direct frisk for b/g	
		a -Ludlum 139 with air proportional probe or equiv.		Non-intrusive Activities: Ground surface near source (as applicable based on potential for soil contamination)  Personnel: Prior to exiting EZ, CRZ	> Background a < 500 cpm/ probe area b/g < 5,000 cpm/ probe area	Notify ESH-1 of elevated readings Dedicated field team member trained in ESH-1 procedures performs surveys (soil, core, personnel, etc.) Increased intermittent ESH-1 coverage a swipes counted using Ludlum 2000 tray counter or equiv.; direct frisk for b/g	Standard levels set by ESH-1
				Equipment: Prior to decon and for release	a > 500 cpm/ probe area b/g > 5,000 cpm/ probe area	Work may only proceed according to approved RWP and with full-time onsite ESH-1 technician (or equiv.) in accordance with Sections 3.2.4 and 3.3.4 of the HASP.	

**TABLE 6-1 (Cont.)  
DIRECT-READING INSTRUMENT REQUIREMENTS**

The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

**PHYSICAL CONDITIONS**

<b>Hazardous Condition/ Substance</b>	<b>Task(s)</b>	<b>Instrument</b>	<b>Procedure</b>	<b>Location and Frequency of Monitoring</b>	<b>Action Level(s)</b>	<b>Response Action(s)</b>	<b>Action Level Rationale</b>
Heat Stress	All	Ambient Temp. Monitor	ER Project Manual for Site Health and Safety Activities.  Section 11.7 Heat Stress	Worker heart rates at frequencies based on ambient temperature and PPE worn as specified in ER Project Manual for Site Health and Safety Activities	80 degrees Fahrenheit or SSO evaluation of the conditions of the operations when the laborers initial heart rate  > 110 beats/min Rest heart rate > 80 beats/min	Implement work/rest regimen, provide shaded rest area, and replace lost body fluids.	Per ER Project Manual for Site Health and Safety Activities Rational.
Noise	2	Noise level meter	ER Project Manual for Site HS Activities	Only monitor non-LANL employees; contact Field Unit HS Rep. if LANL employees need monitoring  Noise measurements required when voice must be raised to communicate between two persons located $\leq$ 3 feet of each other; monitor hearing zone(s) of employees affected by excessive noise  1st day of occurrence & whenever operations change warranting monitoring; SLM - initial measurement and at 30 minute intervals while excessive noise condition persists	85 dBA (Non-LANL employees only) 80 dBA (Hearing Conservation Program - LANL employees only) 84 dBA (Hearing protection required - LANL employees only)	$\geq$ Action Level: Implement appropriate engineering control(s) per Table 4-3; if unable to lower noise levels below AL, demarcate/post zones of excessive noise and limit access only to employees having sufficient hearing protection training, medical surveillance, and hearing protection per this SSHASP	OSHA 29 CFR 1910.95 for non-LANL employees  Per DOE and LANL requirements for LANL employees

**TABLE 6-1 (Cont.)  
DIRECT-READING INSTRUMENT REQUIREMENTS**

The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

**INDUSTRIAL HYGIENE (CHEMICALS/METALS)**

Total Airborne Dust	2,3,4	Mini-ram	EH Project Manual for Site HS Activities	Continuously near point of dust generation; periodically in employees' breathing zones, & downwind/ upwind as needed to characterize source/dispersion	1.58 mg/m <sup>3</sup>  * Marlowe document calculation = 1.58 mg/m <sup>3</sup>	≥ action level (AL) in employee breathing zone implement dust suppression methods to control dust levels below AL  If unable to lower levels below AL, demarcate/post zones of excessive exposure and limit access only to employees having sufficient chemical-specific PPE, training, and medical surveillance per this SSHASP	Allows sufficient time to respond to elevated particulates
---------------------	-------	----------	--	--	---	--	--

**TABLE 6-2  
PERSONAL DOSIMETRY REQUIREMENTS**

This table specifies the personal dosimetry requirements based on the hazardous condition/substance present and the task being performed. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

**HEALTH PHYSICS (RADIATION)**

Hazardous Substance/ Condition	Task(s)	Action Level(s)	Dosimetry Requirement	Action Level(s) Rationale
External Sources of Radiation Exposure	All		Monthly TLD Badge	

**PHYSICAL CONDITIONS**

Hazardous Condition	Task(s)	Procedure	Instrument/ Supplies	Action Level(s)	Action Level Rationale	Response Action(s)
Non-friable Asbestos	While collecting transite wallboard fragments from the soil. Material is a Class IV asbestos material.	NIOSH Analytical Method 7400	Low flow air sampling pump calibrated to 2.5 liters/minute. Sample collection volume based on time frame. Filter is a 25 mm mix cellulose ester filter pad	Lack of a "negative exposure assessment"  0.1 f/cc 8-Hr. TWA  1.0 f/cc 30-min. STEL	29 CFR 1926.1101 (f)(2)(iii)	≥ action level (AL) in employee breathing zone implement dust suppression methods to control dust levels below AL  If unable to lower levels below AL, demarcate/post zones of excessive exposure and limit access only to employees having sufficient asbestos-specific PPE, training per this SSHASP
Noise	In the hearing zone of employees incurring excessive noise levels per Table 6-1 monitoring	LANL ER Decommissioning Project H&S Activities Manual	Personal noise dosimeter(s)	Refer to Table 6-1		

## 7.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

This section provides the PPE requirements for this project in accordance with Section 7 of the HASP. The PPE specified in Table 7-1 are to be used only by personnel who are trained and qualified to use the equipment in accordance with Section 7 of the HASP and Section 10 of the HASP and SSHASP.

**TABLE 7-1  
PPE REQUIREMENTS**

This table identifies the PPE to be used for each task or group of tasks having different requirements. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

PPE REQUIREMENTS	TASK(s)						
	1	2	3	4	5	6	
<b>Head</b>	(Per 29 CFR 1910.135, ANSI Z89.1-1986, or Z89.2 for electrical shock protection).						
Cap				X	X	X	Is only recommended to keep the sun off face and head.
Hard Hat	X	X	X				
<b>Eyes</b>	(per 29 CFR 1910.133, ANSI Z87.1-1989)						
Safety Glasses	X	X	X	X	X	X	Sideshields required. Unless wearing respirator
<b>Face</b>	(Per 29 CFR 1910.133, ANSI Z87.1-1989).						
None	X	X	X	X	X	X	
<b>Body</b>							
None							
Tyvek® suits with attached booties and head cover		X					During asbestos transite collection
Cotton coveralls	X	X	X	X	X	X	To be laundered.
<b>Hands</b>	(Per 29 CFR 1910.137 and 138, ASTM D 120-87).						
<b>INNER GLOVES:</b>							
None					X	X	
Latex or Vinyl	X	X	X	X			Disposable
<b>OUTER GLOVES:</b>							
None	X					X	
Nitrile (≥ 12" lgth & 0.01" thick)		X	X	X			Disposable - Nitrile outer gloves shall be worn by laborers, vacuum operator and any other individual who come in contact with chemical COPCs
Cotton/Leather					X		Disposable - Requirement for cotton gloves may be waived if the gloves hinder the safe operation of the vacuum
Latex, Vinyl or Cotton		X	X	X			Disposable - Personnel in EZ/CRZ not contacting contaminants may wear latex, vinyl or cotton outer gloves.
<b>Feet</b>	(per 29 CFR 1910.136, ANSI Z41-1991)						
Steel-toed work boots	X	X	X	X	X	X	
<b>Respiratory System</b>	(per 29 CFR 1926.1101 (h)).						
Respirator		X					If work occurs within a regulated work area where employees are conducting operations that require the use of respirators.
<b>Ears</b>	(per 29 CFR 1910.95, ANSI Z87.1-1989)						
None	X		X	X	X	X	
Plugs		X					27 NRR minimum

## 8.0 DECONTAMINATION

Provided in this section are the personnel and/or equipment decontamination requirements for this project in accordance with Section 8 of the HASP. TABLE 8-1 specifies the decontamination requirements for each task or group of tasks having different requirements. Decontamination rinsates shall be handled in accordance with the Site Specific Waste Management Plan.

TABLE 8-1 PERSONNEL AND EQUIPMENT DECONTAMINATION						
This table identifies the personnel and equipment decontamination requirements for each task or group of tasks having different requirements. The identification of each task is as follows: Task 1- Site Preparation; Task 2- Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.						
DECON REQUIREMENTS	TASK(s)					
	1	2	3	4	5	6
<b>PERSONNEL AND VACUUM/ENVIRONMENTAL MONITORING EQUIPMENT (EME)</b>						
<b>OPTION 1 - STANDARD APPROACH LEVEL D</b>						
Not Applicable						
Wash Soap	X	X	X	X	X	X
Aqueous Rinse	X	X	X	X	X	X
HEPA vacuum		X				
PPE to be Disposed	X	X	X	X	X	X
PPE to be Laundered	X	X	X	X	X	
						HEPA vacuum off PPE after completion of asbestos collection.
						See Table 7-1 for disposable PPE
						See Table 7-1 for launderable PPE
<b>REMEDIATION EQUIPMENT (Per LANL-ER-SOP-1.08)</b>						
Not Applicable	X		X	X	X	
Localized at Work Site in EZ		X				

## 9.0 EMERGENCY/INCIDENT ACTION PLAN

Provided in this section are the Incident/emergency action requirements, equipment, and supplies for this project in accordance with section 9 of the HASP. Table 9-1 specifies the incident/emergency action requirements for each task or group of tasks having different requirements. Response to an incident or emergency shall occur according to Section 9 of the HASP and this section.

In the event of an incident or emergency, the FTL or SSO will function as the site emergency/incident coordinator, as necessary, and will arrange for immediate notification of LANL emergency response personnel to take control of the scene and/or arrange for immediate notification of appropriate authorities. Other key onsite incident/emergency response personnel are identified below. Only personnel who are trained and certified in accordance with Sections 7, 9, and 10 of the HASP and SSHASP are allowed to respond and use the equipment specified. Incident/emergency contacts and telephone numbers and a map indicating the route to the nearest hospital and medical clinic from TA-11 are included in Appendix D. Both these items shall be posted onsite where readily accessible to field team personnel. Site-specific muster areas shall be determined by the SSO prior to the start of field operations each day and shall be communicated to individuals onsite during the HS Tailgate meeting and as other individuals arrive at the site. Location(s) of muster areas may vary from day-to-day depending upon variable site operations and conditions, and shall be documented daily by the SSO or FTL.

Incidents such as a fire or explosion at one of the TA-11 facilities could require evacuation of the general technical areas. In case of an emergency, TA-11 officials can notify the field team by telephone or in person of any need to evacuate the work area. For ER work, in the event of an incident at the work site (e.g., injury or fire) the appropriate personnel listed in Appendix D shall be promptly notified by phone.

In the unlikely event of a radiological incident, proper notifications and reporting shall be made in accordance with LP107-01.0 "Notification and Reporting of Radiological Incidents."

TABLE 9-1						
EMERGENCY/INCIDENT ACTION REQUIREMENTS						
This table identifies the first-aid/CPR providers and the equipment available onsite to respond to on-site incidents/emergencies for each task or group of tasks having different requirements. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.						
Contact ESH-1 Oversight RCT in the event of any incident or emergency						
<b>First-Aid/CPR Provider(s):</b> Linda Fluk (FTL); Dave Dixon (SSO) as well as all alternate SSO's						
<b>REQUIREMENTS</b>	<b>TASK(S)</b>					
	1	2	3	4	5	6
<b>COMMUNICATIONS</b>						
Cellular phone and/or radio	X	X	X	X	X	X
Air Horn(s), or vehicle horn if air horn is not readily available		X	X	X	X	Three long air horn or vehicle horn blasts means work crew is to evacuate the work area and gather at the muster area.
<b>INCIDENT RESPONSE EQUIPMENT</b>						
Eyewash Station	X	X	X	X	X	X
Industrial first-aid kit	X	X	X	X	X	X
Bio. pathogen and waste disposal kit	X	X	X	X	X	X
						Located in the CRZ and inspected weekly and fluid change monthly
						The first-aid supplies shall be approved by ICF Kaiser Corporate Medical. The contents are to be checked weekly and resupplied by SSO or designee. Contents shall meet the <i>American National Standard Minimum Requirements for Industrial Unit-Type First Aid Kits (ANSI Z 308.1-1978)</i> .
						This kit shall be kept in a weatherproof container. Contents are to be checked weekly and resupplied by SSO or delegate. Contents shall be approved by ICF Kaiser Corporate Medical.
<b>FIRE FIGHTING EQUIPMENT</b>						
Fire extinguisher	X	X	X	X	X	X
						10 lb. A:B:C

## 10.0 TRAINING

Provided in this section are the training requirements for this project in accordance with Section 10 of the HASP. The training requirements specified in Table 10-1 are listed by job title for each task or group of tasks having different requirements. Personnel shall be trained in accordance with and as specified below. Any exceptions or deviations from requirements of the HASP are noted below. Personnel performing the roles indicated below shall have completed and have current documentation of the training specified. The SSO or the FTL shall verify that personnel have met the training requirements prior to authorizing individuals to enter controlled zones of the work site.

**TABLE 10-1  
TRAINING REQUIREMENTS**

This table identifies the personnel training requirements, by role, for each task or group of tasks having different requirements. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.

FPL = Field Project Leader; FTM = Field Team Manager; FTL = Field Team Leader; SSO = Site Safety Officer; RSP = Radiological Screening Personnel; LAB = Laborer; VHO = Vacuum Operator; HPT = Health Protection Technician; RCT = Radiological Control Technician.

R = Read training; C = Classroom training; F = Field training; AN = As needed per the HASP or applicable regulatory requirement; ER = Employer required

Training Requirement	Personnel Role									
	FPL	FTM	FTL	SSO	RSP	LAB	VHO	HPT	RCT	
HASP	R	R	R	R	R	R	R	R	R	
SSHASP	R	R	R	R	R	R	R	R	R	
Pre- Job Start HS Briefing(per Section 10.1 of HASP)	For C	For C	For C	For C	For C	For C	For C	For C	For C	
Daily HS Tailgate Mtgs(per Section 10.2 of HASP)	F	F	F	F	F	F	F	F	F	
Conduct of Operations & Occurrence Reporting	R	R	R	R	R	R	R	R	R	
Employee Commitment to Safety	ER	ER	ER	ER	ER	ER	ER	ER	ER	
OSHA Rights & Responsibilities	R	R	R	R	R	R	R	R	R	
Health Physics Checklist Indoctrination	C	C	C	C	C	C	AN	C	C	
Rad. Worker II (LANL or equiv.)	C	C	C	C	C	C	AN	C	C	
40 hr. HAZWOPER	C	C	C	C	C	C	AN	C	C	
24 hr. HAZWOPER Supervised Fieldwork	F	F	F	F	F	F	AN	F	F	
8 hr. HAZWOPER Annual Refresher	AN	AN	AN	AN	AN	AN	AN	AN	AN	
8 hr. HAZWOPER Supervisor	AN	C	C	AN	AN	AN	AN	AN	AN	
AHERA Asbestos Abatement Contractor/Supervisor				C						
AHERA Project Designer				C						
AHERA Asbestos Abatement Inspector				C						
SSO (per Section 10.1.1.5 of the HASP)				F/C						
Employer's Hazard Communication Program	AN	AN	ER	ER	ER	ER	AN	ER	ER	
Fire Extinguisher Use			C	C	C	C	C			
PPE (per Section 7.1 of HASP)			F/C	F/C	F/C	F/C	F/C	F/C	F or C	
Hearing Conservation (Section 4.2.2.7 of HASP)	AN	AN	AN	AN	AN	AN	AN	AN	F/C	
Sanitation [29 CFR 1926.51]		R	R	R						
1st Aid (Amer. Red Cross or equiv.)		R	R	R						
CPR (Amer. Red Cross or equiv.)	Required for the First-Aid/CPR Provider(s) listed in Table 9-1, only.									
Bloodborne Pathogens (29 CFR 1910.1030)	Required for the First-Aid/CPR Provider(s) listed in Table 9-1, only.									

## 11.0 MEDICAL SURVEILLANCE

Provided in this section are the medical surveillance requirements for this project which have been established in accordance with Section 11 of the HASP. The task specific medical surveillance requirements, provided in Table 11-1, were established based on the hazards present at each PRS's and the associated action levels and federal requirements.

<b>TABLE 11-1 MEDICAL SURVEILLANCE REQUIREMENTS</b>			
This table identifies the medical surveillance requirements for each task identified in Table 2-3 based on the associated hazards, action levels and federal requirements. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.			
<b>Hazard</b>	<b>Task(s)</b>	<b>Action Level</b>	<b>Requirement</b>
Hazardous Waste Operations	1, 2, 3, 4, 5, and 6	Potential for exposure to hazardous substances or health hazards $\geq$ PELs or published exposure limits during HAZWOPER work	29 CFR 1926.65(f) 29 CFR 1910.120 (f)
Asbestos	2	Potential for exposure to asbestos $\geq$ TWA or STEL during HAZWOPER work	29 CFR 1910.1001 29 CFR 1926.58
Bloodborne Pathogens or Potentially Infectious Materials	6	Any occupational exposure	29 CFR 1910.1030(f)
Hearing Protection	2	$\geq$ 85 dBA	29 CFR 1910.95(g)

## 12.0 QUALITY CONTROL & QUALITY ASSURANCE (QC/QA)

Provided in this section are the QC/QA requirements for this project in accordance with Section 12 of the HASP. The inspection requirements, provided in Table 12-1, were established based on the type of work being performed and the associated federal requirement(s). The FTL shall see that the inspections are conducted and documented, and that appropriate actions are taken and documented to rectify identified deficiencies, if any.

<b>TABLE 12-1 INSPECTION REQUIREMENTS</b>		
<p>This table identifies the inspection requirements based on the type of work being performed and the associated federal requirement(s). The inspector by title and the associated tasks are also identified. The identification of each task is as follows: Task 1- Site Preparation; Task 2-Site Remediation; Task 3- Field Screening and Confirmation Sampling; Task 4- Decontamination; Task 5- Restoration; and Task 6- Incident Response.</p>		
Inspection	Inspector	Task(s)
Job Site, Material and Equipment (in accordance with 29 CFR 1926.20(b)(2))	SSO or CP	All
General Sanitation (i.e., potable and non-potable water, toilets, washing facilities, eating and drinking areas, vermin control, and/or change rooms; in accordance with 29 CFR 1926.51)	SSO	All
Materials handling, storage, use and disposal (in accordance with 29 CFR 1926.250 and 252, and 29 CFR 1926.1101)	SSO	All
Signs, Signals and Barricades (in accordance with 29 CFR 1926.200 and 29 CFR 1926.1101 (k)(7) and (8))	SSO	All
PPE (Section 7 and 29 CFR 1926.95 and 29 CFR 1926.1101 (h) and (i))	User/SSO	All
Incident/emergency response equipment (prior to each use and at least monthly)	SSO	6
Electrical Equipment	SSO	All
Tools - Hand and Power	User	All
Excavation and Trenches	SSO	All
Motor Vehicle and Mechanical Equipment	SSO/User	All
Fire extinguishers (per 29 CFR 1926.150(a) and (c))	SSO	6
CP = Competent Person		

### 13.0 RECORDKEEPING

Provided in this section are the recordkeeping requirements for this project in accordance with Section 13 of the HASP. The HS records specified in Table 13-1 shall be completed in accordance with Section 13 of the HASP and kept onsite as indicated.

TABLE 13-1 RECORDKEEPING REQUIREMENTS		
This table identifies the records/forms to be filled out and/or maintained by the SSO of designee. The requirement reference and the requirement for keeping the records/forms on site are also identified.		
Record/Form	Requirement Reference	Keep Onsite
HASP	HASP Section 1	X
This SSHASP	HASP Section 1	X
Completed SSHASP Modification Forms	HASP Section 1	X
SSO's Daily Logbook	HASP Section 13.1	X
Documentation of Medical Surveillance	HASP Section 11	
Documentation of Training Requirements	HASP Section 10	
Equipment and Supplies Inspection Records	HASP Section 12.1	X
Daily Health and Safety Inspections Records	HASP Section 12.1	X
Documentation of Daily Calibration	HASP Section 6.0	X
Documentation of Equipment Maintenance	HASP Section 6.0	X
Guidance Manual for Exposure Limits	HASP Section 6.0	X
Operational Manuals for Monitoring Equipment	HASP Section 6.0	X
Required Excavation Permit	HASP Section 4.2.2	X
Direct-reading Monitoring Results	HASP Section 6 and Applicable Methods in the LANL ER Decommissioning Project H&S Activities Manual	X

**APPENDIX A**

**MAP(S) OF SITE LOCATIONS,  
ADJACENT FACILITIES**

**APPENDIX B**

**HAZARDOUS SUBSTANCE - HAZARD ASSESSMENT**

HAZARDOUS SUBSTANCE - HAZARD ASSESSMENT			
This table includes a health hazard assessment, and associated rationales, of each chemical product and site contaminant listed in Table 2-1, which could pose an occupational health threat during the performance of the following tasks: TASK 1- Site Preparation; TASK 2-Site Remediation; TASK 3- Field Screening and Confirmation Sampling; TASK 4- Decontamination; TASK 5- Restoration; and Task 6- Incident Response.			
Substance	Maximum Data <sup>1</sup>		Hazard Assessment Rating/Rationale <sup>2</sup>
	Value (mg/kg)	Location <sup>1</sup>	
<b>CHEMICAL PRODUCTS USED</b>			
<b>Calibration Gases</b>	N/A	11-001(c)	<b>Negligible</b> Only small quantities of compressed gases are used to calibrate monitoring equipment. Calibration will be conducted at remote location.
Isobutylene			
<b>HE Field Test Kit</b>	NA	11-001(c)	<b>Negligible</b> Only small quantities of chemicals are used to conduct tests and all chemicals are contained within reagent. MSDSs shall be maintained on site for all chemical products.
RDX			
<b>Fuels/Lubricants</b>	N/A	11-001(c)	<b>Negligible</b> Only small quantities of Fuels/Lubricants are used to refuel and maintain heavy equipment. MSDSs shall be maintained on site for all chemical products.
Gasoline			
Diesel Fuel			
Motor Oil Lubricants			
<b>CONTAMINANTS OF POTENTIAL CONCERN</b>			
<b>Chemicals (Sample Analysis)</b>	0.069 1.8 0.37	11-001(c)	<b>Negligible to Minor</b> For tasks 1, 5, and 6, contact with chemicals and metals will be negligible since these tasks will not pose any exposure. Phthalates are widely used plasticizers and are common contaminants in laboratory analysis. For tasks 2, 3, and 4, negligible to minor illness possibly could occur but is unlikely to occur due to the vacuum system will be exhausting down wind and direct handling of soil will be minimized. Exposures are not expected to exceed the action levels. (Organics: Di-n-butyl phthalate. TWA 5 mg/m <sup>3</sup> ). (Metals: Arsenic: 0.01 mg/m <sup>3</sup> TWA.; Barium: 0.5 ppm TLV. PEL.: Chromium: (Carc.) 0.5 ppm PEL.: Copper: 0.1 ppm PEL.: Lead: (Carc.) .005 ppm PEL.: Manganese: 0.2 mg/m <sup>3</sup> TWA.; Aluminum: 10.0 mg/m <sup>3</sup> TWA. Action Level Based on a cumulative dose of all metals: 1.58 mg/m <sup>3</sup> <sup>2</sup> for a 8-hr TWA.
Benzoic Acid			
Bis(2-ethylhexyl)phthalate			
Di-n-butyl phthalate	11-001(c)		
<b>Metals (Sample Analysis)</b>			
Aluminum	12,300		
Arsenic	212		
Barium	171		
Chromium	103		
Copper	19		
Lead	402		

<sup>1</sup> RFI Work Plan for Operable Unit 1082, Environmental Restoration Program (LANL August 1993)

<sup>2</sup> Marlowe, C., Action Levels for Hazardous Waste Site Work. Camp, Dresser, and McKee, 1994.

**CONTAMINANTS OF POTENTIAL CONCERN**

Manganese	407		
HE			<b>Negligible</b>
RDX	0.414	11-001(c)	Only small quantities of HE were detected in soil. Toxic effects are not expected due to low concentrations of RDX.
Miscellaneous			<b>Negligible to Minor</b>
Non-friable asbestos	NA	11-001(c)	Observed in soil at site but not analyzed. May be contacted and handled during Task 2 OSHA 0.1 fcc TWA and 1.0 STEL
Radionuclides	NA	11-001(c)	None detected

**APPENDIX C**  
**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL**  
**REFERENCE MATERIALS**

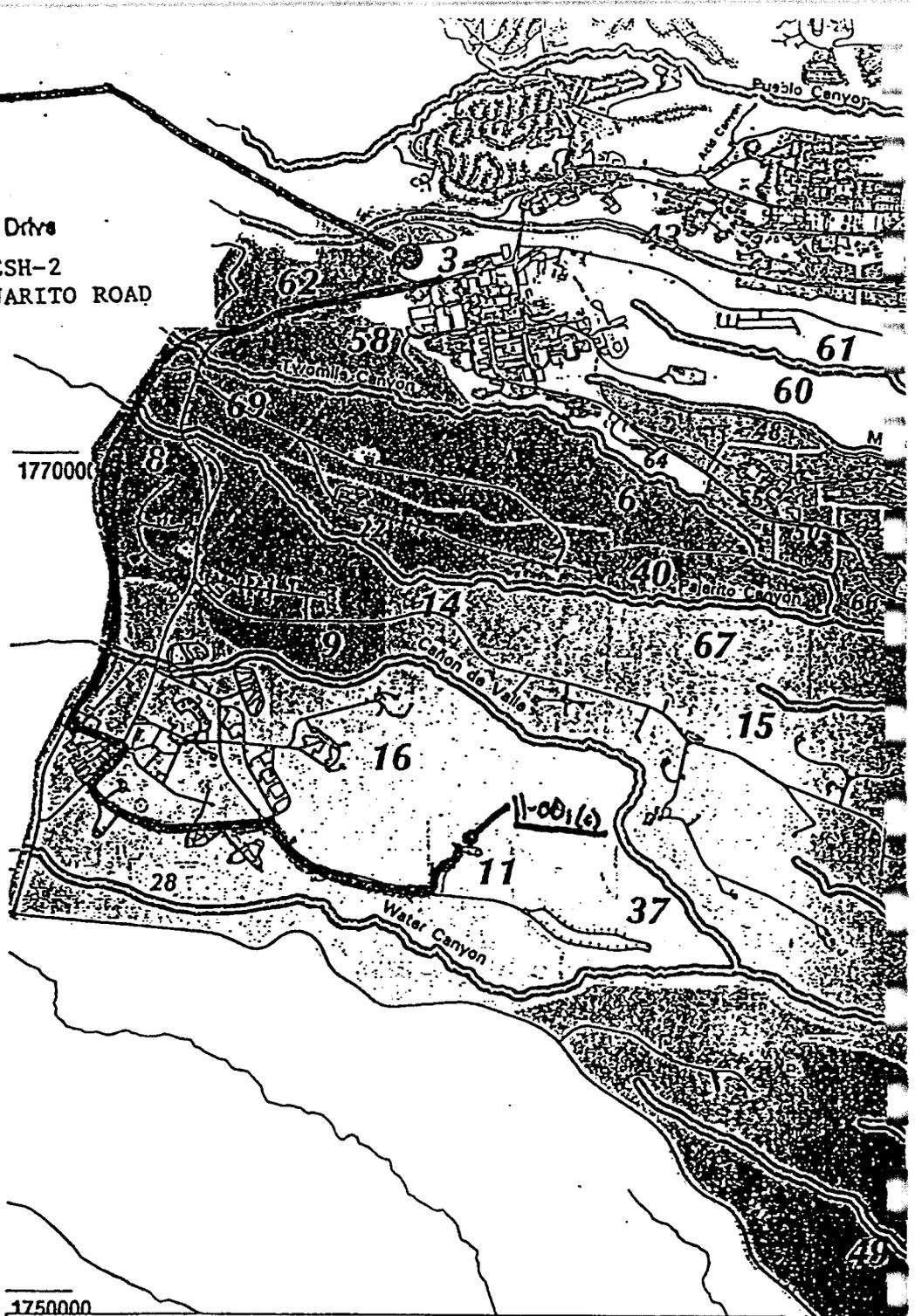
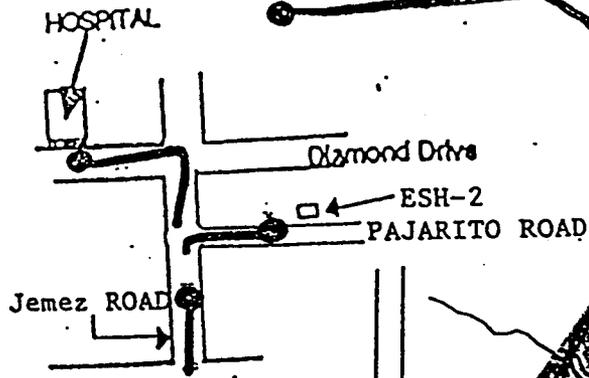
## CHEMICAL, PHYSICAL, AND TOXICOLOGICAL REFERENCE MATERIALS

The following physical, chemical, and toxicological reference materials shall be maintained on-site:

1. *NIOSH Pocket Guide to Chemical Hazards.*
2. *ACGIH Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.*
3. *HNu Photoionization Detector Guidance Information*
4. *Quick Selection Guide to Chemical Protective Clothing*

**APPENDIX D**

**EMERGENCY CONTACTS  
AND  
ROUTE(S) TO MEDICAL SERVICES**



## Environmental Restoration Field Units

-  Drainage
-  TA Boundary
-  Road, Paved
-  Permanent Structure
-  Field Unit 1  
FPL - Garry Allen
-  Field Unit 2  
FPL - Gene Gould



**APPENDIX E**

**HAZARDOUS SUBSTANCES**

**EXPOSURE**

**CALCULATIONS**

**ACTION LEVEL EXPOSURE LIMIT CALCULATION**

FOR 11-001(C)

	<u>Al</u>	<u>Ar</u>	<u>Ba</u>	<u>Cr</u>	<u>Cu</u>	<u>Pb</u>	<u>Mn</u>
Analytical Conc. (mg/kg)	12300	21.2	5300	10.3	2800	40.2	407
Exposure Limit (mg/m3)	10.0	.01	0.5	0.5	0.1	0.005	0.2
Sub Totals:	<b>123000</b>	0.212	2650.0	5.15	280	.201	81

Total: 126017

Calculation:  $\frac{10^6}{\text{Total x Safety Factor}} = \frac{10^6}{(126017 \times 5)} = 1.58 \text{ mg/m}^3$

[Safety Factor Range: 1-10]

Al

Analytical Conc. (mg/kg)	12300
Exposure Limit (mg/m3)	10.0
Sub Totals(mg/kg):	123000

Total(mg/kg): 123000

Calculation:  $\frac{10^6}{\text{Total x Safety Factor}} = \frac{10^6}{(123000 \times 5)} = 1.62 \text{ mg/m}^3$

[Safety Factor Range: 1-10]

**7.6 Characterization Strategy Form**

**THIS PAGE LEFT INTENTIONALLY BLANK**

## CHARACTERIZATION STRATEGY FORM

OU Number	PRS/SWMU Numbers	Title
OU 1082	11-001(c)	VCA
	16-033(k)	

<b>Name:</b> Peter Gram	<b>Date:</b> 08/07/96
<b>FPL:</b> Brad Martin	<b>WMC:</b> R.L. Kidman
<b>Type of Activity:</b> VCA	

**Site Description:** PRS 11-001(c) was a firing pit consisting of a 12.5 semicircular wall, 4.5 feet high and constructed of 37-in thick concrete. The pit has been demolished and the site leveled. Pieces of debris litter the area and low levels of contamination were in soil samples from site characterization conducted in 1995. No known documentation of the precise use and dates of this firing pit has been found. Addition process history and investigation results are attached.

PRS 16-033(k) is an underground gasoline storage tank near building TA-16-560. There is no evidence of tank leakage. The site has only been used for a potable water supply system. No other lab activities have taken place. If soil contamination is found, it will be removed.

### Investigation or Remediation Waste Description and Volume Estimate:

#### Previous Investigation:

Phase I RCRA Facility Investigation sampling revealed that arsenic is the only constituent present at significant levels (21.2 ppm). Lead is present in the soil at concentrations well below the SAL (40.2 ppm), as well as Barium (171 ppm). Asbestos (transite) is present on the ground surface.

No investigations have been conducted at 16-033(k).

#### Expected Waste Types and Volumes:

<u>ITEM</u>	<u>WASTE TYPE</u>	<u>ANTICIPATED VOLUME</u>
Decontaminated IDW	Municipal refuse	<1 yd <sup>3</sup> (for both PRSs)
Contaminated soils	Non-haz, non-rad waste	<5 yd <sup>3</sup> (for 11-001-c)
Decontamination water	Non-haz, non-rad waste	<20 gal. (for each PRS)
Gasoline/soil from UST	New Mexico special waste	<30 gal. (for 16-033-k)
	Hazardous waste	none
	Radioactive waste	none
	Mixed waste	none

### Characterization Strategy:

PPE and sampling waste will be decontaminated following approved, established procedures. The soils from 11-001(c) will be characterized based upon the 1995 analytical results. Decon liquid from 11-001(c) will also be characterized based upon the 1995 analytical results. The soils and decon liquid from 16-033(k) will be characterized based upon BTEX, TPH, and total metals test results. Rad field instruments (ESP-1, HP-260, NaI 2x2 or equivalent) will be used at both locations to screen for alpha, beta, and gamma emissions.

**Preliminary RCRA Determination:**

<input checked="" type="checkbox"/> No 90-Day Storage Requirement (non-RCRA)
Radioactive, hazardous and mixed waste is not anticipated.

90-Day Storage Requirement (RCRA)

**Analyte Suite: PRS 11-001(c)**

Analyte Category	Analytical Method	Direct Sampling of Containerized Waste	Acceptable Knowledge		
			Existing Information		Data from Site Characterization
			Present	Absent	
Volatile Compounds	8260	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Semi-Volatile Compounds	8270	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Organic Pesticides and PCBs		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Inorganic Compounds	XRF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High Explosive Compounds	8330	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Alpha	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Beta	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Gamma	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tritium*		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Asbestos		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TCLP	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metals	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Organics	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pesticides, herbicides, fungicides	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Isotopic Uranium	HASL 300	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Isotopic Plutonium	HASL 300, Pu-06	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

\*If "Absent" is checked under existing information for tritium, you must specify (in the "Characterization Strategy" box) the existing information supporting your contention that elevated tritium levels are not present.

**Analyte Suite: PRS 16-033(k)**

Analyte Category	Analytical Method	Direct Sampling of Containerized Waste	Acceptable Knowledge		
			Existing Information		Data from Site Characterization
			Present	Absent	
Volatile Compounds	8260	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Semi-Volatile Compounds	8270	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Organic Pesticides and PCBs		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Inorganic Compounds	XRF	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
High Explosive Compounds	8330	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Alpha	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Beta	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Gamma	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tritium*		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Asbestos		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TCLP	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metals	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Organics	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pesticides, herbicides, fungicides	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Isotopic Uranium	HASL 300	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Isotopic Plutonium	HASL 300, Pu-06	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

\*If "Absent" is checked under existing information for tritium, you must specify (in the "Characterization Strategy" box) the existing information supporting your contention that elevated tritium levels are not present.

**Signatures:**

\_\_\_\_\_  
 ER Waste Management Coordinator  
 Representative

\_\_\_\_\_  
 Waste Management

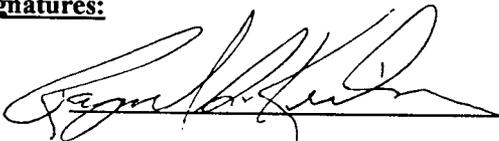
\_\_\_\_\_  
 Form Author

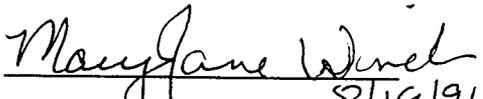
**Analyte Suite: PRS 16-033(k)**

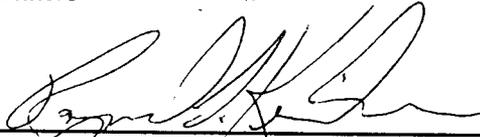
Analyte Category	Analytical Method	Direct Sampling of Containerized Waste	Acceptable Knowledge		
			Existing Information		Data from Site Characterization
			Present	Absent	
Volatile Compounds	8260	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Semi-Volatile Compounds	8270	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Organic Pesticides and PCBs		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Inorganic Compounds	XRF	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
High Explosive Compounds	8330	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Alpha	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Beta	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Gross Gamma	field screening	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tritium*		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Asbestos		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TCLP	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metals	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Organics	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pesticides, herbicides, fungicides	SW 846	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Isotopic Uranium	HASL 300	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Isotopic Plutonium	HASL 300, Pu-06	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

\*If "Absent" is checked under existing information for tritium, you must specify (in the "Characterization Strategy" box) the existing information supporting your contention that elevated tritium levels are not present.

**Signatures:**

  
 ER Waste Management Coordinator  
 Representative

  
 Waste Management 8/19/96

  
 Form Author

## **1.1 Site Type and Description**

SWMU 11-001(c) was a firing pit consisting of a 12.5 ft semicircular wall, 4.5 ft high constructed of 37-in thick concrete. The former location of the firing pit is on the edge of Water Canyon, west of TA-16-370. Remnants of the foundation remain on the site.

### **1.1.1 Operation History**

PRS 11-001(c) is discussed in detail in Section 5.16 of the RFI work plan (RFI Work Plan for OU 1082 1993 1094). No known documentation of the precise use and dates of use of this firing pit has been found.

Because of the uncertain history of SWMU 11-001(c), samples were collected and analyzed for HE and its by-products, SVOCs, Metals and Cyanides, and for natural and depleted uranium (used to simulate weapons geometry in documented K-Site experiments).

### **1.1.2 COPCs**

SWMU 11-001(c) was sampled to determine if surface soil contained HE or uranium at levels of concern. The only contaminant identified at the site during RFI sampling was arsenic. Asbestos, possibly transite, was visually identified during sampling activities.

RFI sampling was performed between September 19 and September 22, 1995. The field activities implemented at the site included selection of sampling locations, land, geophysical, and screening surveys, and field sampling activities.

## **2.1 RFI Information/Other Decision Data**

### **2.1.1 Field Investigation for SWMU 11-001(c)**

Sampling at SWMU 11-001(c) consisted of four hand-augered cores selected from each quadrant of the site. Cores were augered to the soil/tuff interface. Two samples were collected from each core hole, the 0-18 in. section and the 6 in. section above the interface or 6 in. bottom of the core. One location (11-0001) was biased to the presence of a detonator. These samples were submitted for laboratory analysis and are summarized below in Table 2.1-1.

TABLE 2.1-1: Sample Depths and Locations

Sample ID	Location ID	Location Description	Sample Depth
0311-95-0001	11-0001	NE edge of pit, on lip	0 to 6 inches
0311-95-0002	11-0001	NE edge of pit, on lip	6 to 11 inches*
soil/tuff interface	11-0001	8 inches	
0311-95-0003	11-0002	NW corner of pit, on lip	0 to 4 inches
0311-95-0004	11-0002	NW corner of pit, on lip	5 to 8 inches*
soil/tuff interface	11-0002	7 inches	
0311-95-0005	11-0003	SW corner of pit, below lip	0 to 6 inches
0311-95-0006	11-0003	SW corner of pit, below lip	6 to 11 inches*
soil/tuff interface	11-0003	9 inches	
0311-95-0007	11-0004	SE corner of pit, below lip	6 to 12 inches*
0311-95-0008	11-0004	SE corner of pit, below lip	12 to 16 inches*
soil/tuff interface	11-0004	13 inches	

\*= sampled using a hand auger

All samples were screened for radioactivity and high explosives (HE); all results were negative. All samples were also screened for volatile organics using a photoionization detector (PID). These screening results are located in Table 2.1-2.

TABLE 2.1-2  
SCREENING RESULTS

Sample ID	Location ID	Screening Result
0311-95-0002	11-0001	5.0 ppm
0311-95-0003	11-0002	1.2 ppm
0311-95-0005	11-0003	0.8 ppm
0311-95-0006	11-0003	3.0 ppm
0311-95-0007	11-0004	1.5 ppm
0311-95-0008	11-0004	6.0 ppm

Table 2.1-3 lists the analytical request numbers for samples collected at SWMU 11-001(c). Figure 2.1-1 shows the locations of the lab samples at these PRSs.

TABLE 2.1-3  
SUMMARY OF ANALYTICAL REQUEST NUMBERS FOR SAMPLES COLLECTED  
AT SWMU 11-001(c)

LOCATION ID	SAMPLE ID	DEPTH (ft)	MATRIX	SVOCs	INORGs	TOTAL U	HE
11-0001	0311-95-0001	0-0.5	Soil	1192	1193	1194	1192
11-0001	0311-95-0002	0.5-1	Soil	1192	1193	1194	1192
11-0002	0311-95-0003	0-0.3	Soil	1192	1193	1194	1192
11-0002	0311-95-0004	0.3-0.7	Soil	1192	1193	1194	1192
11-0003	0311-95-0005	0-0.5	Soil	1192	1193	1194	1192
11-0003	0311-95-0006	0.5-1	Soil	1192	1193	1194	1192
11-0004	0311-95-0007	0.5-1	Soil	1192	1193	1194	1192
11-0004	0311-95-0008	1-1.3	Soil	1192	1193	1194	1192

TABLE 2.1-4

## INORGANICS WITH CONCENTRATIONS GREATER THAN BACKGROUND UTLs FOR PRS 11-001(c)

SAMPLE ID	DEPTH (ft)	SOIL/ROCK UNIT	ALUMINUM (mg/kg)	ARSENIC (mg/kg)	BARIUM (mg/kg)	CHROMIUM (mg/kg)	COPPER (mg/kg)	LEAD (mg/kg)	MANGANESE (mg/kg)	NICKEL (mg/kg)	VANADIUM (mg/kg)
LANL UTL <sup>a</sup> (all soil)	N/A <sup>c</sup>	N/A	38 700	7.82	315	19.3	15.5	23.3	714	15.2	41.9
LANL UTL (Qbt4)	N/A	N/A	6 200	2	42	5.4	1.6	4	370	<2	9.5
SAL <sup>b</sup>	N/A	N/A	77 700	NC <sup>d</sup>	5 300	210	2 800	400	NC	1 530	540
0311-95-0001	0-0.5	soil	12 300	21.2	171	10.3	19	40.2	176 (J- <sup>e</sup> )	8.5 (J+ <sup>f</sup> )	23.6
0311-95-0002	0.5-1	Qbt4	5 890	6.5	127	5.7	8.5	12.8	249 (J-)	5.8 (J+)	15.9
0311-95-0004	0.3-0.7	Qbt4	3 530	0.84	59.3	3.5	3.5	11.4	407 (J-)	2.4 (J+)	10.8
0311-95-0006	0.5-1	Qbt4	6 960	1.7	26.2	4.1	4	9.3	143 (J-)	3.4 (J+)	9.1
0311-95-0008	1-1.3	Qbt4	5 320	0.95	24.6	3	3.9	3	176 (J-)	3.4 (J+)	6.1

a UTL = Upper tolerance limit.

b SAL = Screening action level.

c N/A = Not analyzed.

d NC = Not calculated.

e J- = Analyte is present. Concentration reported is an estimated value, with a low bias.

f J+ = Analyte is present. Concentration reported is an estimated value, with a high bias.

### 2.1.3 Evaluation of Organics

RDX was present in sample 0311-95-0006 at a level of 0.414 mg/kg, a level significantly below the SAL of 4 mg/kg (Table 2.1-5). Phthalates were present at low levels in several samples. However, one of the phthalates was present in the method blank as a laboratory contaminant. Phthalates are widely used as plasticizers and are a common contaminant in laboratory analysis.

**TABLE 2.1-5**  
**PRS 11-001(c) SOIL CONCENTRATIONS FOR ORGANIC ANALYTES WITH VALUES**  
**GREATER THAN DETECTION LIMITS**

Sample ID	Depth (ft)	Benzoic Acid (mg/kg)	Bis (2-ethylhexyl) phthalate (mg/kg)	Di-n-butyl phthalate (mg/kg)
SAL	N/A <sup>a</sup>	100 000	32	6 500
EQL <sup>b</sup>	N/A	3.3	0.33	0.33
0311-95-0001	0-0.5	0.16 (J <sup>c</sup> )	8 (E <sup>d</sup> ,B <sup>e</sup> )	0.1 (J)
0311-95-0001DL <sup>f</sup>	0-0.5	7.1 (U <sup>g</sup> )	9.8 (B)	0.095 (J)
0311-95-0002	0.5-1	0.12 (J)	3 (U)	0.35 (U)
0311-95-0003	0-0.3	0.085 (J)	1.7 (U)	0.37 (U)
0311-95-0004	0.3-0.7	0.06 (J)	1.8 (U)	0.36 (U)
0311-95-0005	0-0.5	0.089 (J)	1 (U)	0.36 (U)

a N/A=Not applicable.

b EQL=Estimated quantitation limit

c J = Analyte is present. Concentration reported is an estimated value.

d E = Concentration of analyte was outside calibration range.

e B = Analyte was found in associated method blank.

f These are the analytical results for sample 0311-95-0001 after dilution and reanalysis.

g U = Analyte was not detected.

**7.7 VCA Checklist and Fieldwork Authorization Form**

**THIS PAGE LEFT INTENTIONALLY BLANK**

Voluntary Corrective Action (VCA)  
Checklist and Fieldwork Authorization Form  
PRS No. 11-001(c) HSWA or AOC

- COPC(s) defined.
- Nature and extent defined or field screening method available to guide where not defined.
- Remedy is obvious.
- Time for removal is less than 6 months.
- Remedy is final.
- Land use assumptions straightforward.
- Treatment, Storage, Disposal Facilities are available for waste type and volume.
- Cleanup cost is reasonable for the planned action, and meets accelerated decision logic criterion for decision to proceed with VCA.

Explain criteria not checked above. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Through reviewing the above criteria associated with this site, I believe that a VCA is the appropriate Accelerated Cleanup approach.

FPL *[Signature]* Date 7/22/96  
FPC *Joseph H. Mose* Date 7/23/96

The undersigned have reviewed the final plan and believe that it fully satisfies the appropriate Accelerated Cleanup approach.

FPL *[Signature]* Date 8/22/96  
FPC *Joseph H. Mose* Date 08/23/96

Through reviewing the VCA Plan, for site(s) 11-001(c), and believing that the above criteria have been met, I authorize the fieldwork to proceed.

DOE ER Program Manager *T.J. Gyl* Date 8/28/96

**7.8 Cost Estimate**

Table 7.8-1 lists the estimates costs associated with the VCA.

**TABLE 7.8-1  
COST ESTIMATES**

<b>ACTIVITY</b>	<b>COST</b>
Pre-field activities (field preparation and plan development)	\$9 000
Cleanup	\$25 000
Waste management disposal	\$1 500
Sampling/analytical	\$2 000
Post-field activities and report	\$9 000
<b>Total Estimated Cost</b>	<b>\$46 500</b>

**8.0 REFERENCES**

EPA (US Environmental Protection Agency), April 10, 1990. Module VIII of RCRA Permit No. NM0890010515, EPA Region 6, issued to Los Alamos National Laboratory, Los Alamos, New Mexico, effective May 23, 1990, EPA Region 6, Hazardous Waste Management Division, Dallas, Texas. **(EPA 1990, 0306)**

LANL (Los Alamos National Laboratory), July 1993. "RFI Work Plan for Operable Unit 1082," Los Alamos National Laboratory Report LA-UR-93-1196, Los Alamos, New Mexico. **(LANL 1993, 1094)**

LANL (Los Alamos National Laboratory). "Los Alamos National Laboratory Environmental Restoration Program Standard Operating Procedures," Los Alamos National Laboratory report, Los Alamos, New Mexico. **(LANL, 0875)**

**9.0 ATTACHMENTS**

**THIS PAGE LEFT INTENTIONALLY BLANK**