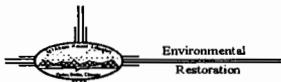


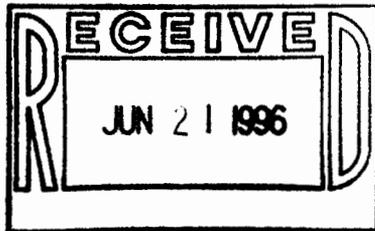
Barbara



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



U. S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504



Date: June 13, 1996
Refer to: EM/ER:96-343

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: VOLUNTARY CORRECTIVE ACTION (VCA) COMPLETION REPORT FOR ACTIVITIES AT TECHNICAL AREA (TA) 33, POTENTIAL RELEASE SITES (PRSS) 33-010(a), (d), and (g) AND 33-011(b)

Dar Mr. Garcia:

Enclosed please find a copy of the VCA Completion Report for cleanup activities in TA-33, PRSS 33-010(a), (d), and (g) and 33-011(b), completed in Fiscal Year 1996. PRS 33-010(a), (d), and (g) are listed in the Hazardous and Solid Waste Amendments (HSWA) Module of the Los Alamos National Laboratory's Resource Conservation and Recovery Act operating permit and we are, therefore, asking for your concurrence in our recommendation to remove these sites from the HSWA Module. PRS 33-011(b) is not listed in the HSWA Module and, therefore, that portion of the report is being submitted for your information only.

The Department of Energy has reviewed and approved this report and has agreed with our recommendation for no further action to remove these sites from the HSWA Module through a permit modification and to remove them from our total list of PRSS. The approval form is attached to the report. The Certification of Completion has been signed and is also included in the enclosed report.

If you have any questions, please call Roy Michelotti at (505) 667-7444 or Joe Mose at (505) 667-5808.

Sincerely,

Jorg Jansen, Program Manager
LANL/ER Project

Sincerely,

Theodore J. Taylor, Program Manager
DOE/LAO

JJ/TT/rfr



- Enclosures: (1) Final VCA Completion Report for TA-33, PRS(s) 33-010(a), (d), and (g) and 33-011(b)
(2) Certification of Completion
(3) DOE Approval Form

Cy (w/ encs.):

R. Michelotti, CST-18, MS E525
J. Mose, LAAO, MS A316
D. Neleigh, EPA, R.6, 6PD-N (2 copies)
D. Griswold, AL-ERD, MS A906
J. Harry, EM/ER, MS M992
B. Hoditschek, NMED-HRMB
R. Kern, NMED-HRMB
N. Naraine, DOE-HQ, EM-453
M. Shaner, CIO, MS A117 (5 copies)
T. Taylor, LAAO, MS A316
N. Weber, NMED-AIP, MS J993
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
G. Rael, AL-ERD, MS A906
W. Spurgeon, DOE-HQ, EM-453
J. Vozella, LAAO, MS A316
EM/ER File, MS M992

Voluntary Corrective Action Completion Report for

Solid Waste Management Units at TA-33

33-010(a), Canyon-Side Disposal Area
33-010(d), Surface Disposal Area
33-010(g), Canyon-Side Disposal Area
33-011(b), General Storage Area

Field Unit 3

**Environmental
Restoration
Project**

June 1996

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-96-1839

11-22

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1.0 INTRODUCTION

From 1947 to 1972 Technical Area (TA) 33 was used for beryllium-polonium weapons component experiments. High explosives (HE) and uranium were used in some tests. The site contains gun-firing areas and firing sites at East and South Sites, with offices, a laboratory, and shop complex at Main Site. A National Radio Astronomy Observatory (NRAO) antenna is currently operational at TA-33. Additional historical information on TA-33 is in the 1992 Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan (LANL 1992, 0784).

The solid waste management units (SWMUs) addressed in this voluntary corrective action (VCA) report are listed below in Table 1.0-1 and are located at East Site, South Site, and the NRAO Site. SWMU 33-010(b), which was addressed in the VCA plan, will not be included in this report due to delays in field implementation. A VCA Report for SWMU 33-010(b) will be submitted within 30 days of receiving confirmatory sampling data.

**TABLE 1.0-1
SWMU DESCRIPTION**

SWMU NUMBER	SECTION	SWMU LOCATION	SWMU DESCRIPTION	WASTE DESCRIPTION
33-010(a)	2.1.1	East Site, rim of White Rock Canyon	Canyon-side disposal area	Debris, metal, wood, plastic foam
33-010(d)	2.2.1	North edge of East Site, South rim of Ancho Canyon	Surface disposal area	Debris, foam, glass, concrete, metal scrap
33-010(g)	2.3.1	South and East edge of South Site, north Chaquehui Canyon	Canyon-side disposal area	Debris, metal scrap
33-011(b)	2.4.1	NRAO Site	Storage area	Debris, metal scrap

The objective of Phase I RFI sampling was to determine if contaminants were present at levels of concern. While the Phase I RFI objective was met, it was not determined whether the debris present within each of the SWMUs was contaminated; therefore, the VCA objective was to screen and remove the debris from the PRSs. The debris removal was an obvious and final remedy requiring less than six months to accomplish.

Although not regulated under RCRA, the Phase I investigation and the VCA addressed radioactive contaminants.

Lead was the contaminant of potential concern (COPC) identified at SWMU 33-010(a) in this VCA Report during 1994 sampling, as described in the TA-33 VCA plan (LANL 1995, 02-112). The nature and extent of contamination was easily identified. No other COPCs were identified at SWMU 33-010(d and g) or 33-011(b).

SWMUs 33-010(a, d, and g) are listed in Table A of the Laboratory's Hazardous and Solid Waste Amendments (HSWA) permit. SWMU 33-011(b) is not on the HSWA permit. Because these sites involved only debris removal, they were pursued as VCAs and not expedited cleanups.

This report serves as a formal recommendation to the Department of Energy (DOE) and New Mexico Environment Department to approve no further action for these SWMUs.

2.0 SITE CHARACTERIZATION PRIOR TO CLEANUP ACTIVITY

RFI sampling was performed between May and August 1994. The field activities implemented at the sites included selection of sampling locations, land, geophysical, and screening surveys, and field sampling activities. These activities are generic to all SWMUs addressed in the 1994 RFI and are located in Section 1.3 of the December 1995 RFI Report (Environmental Restoration Project 1995, 1288).

When the RFI work plan for TA-33 was written, no LANL-wide background soil data existed. The TA-33 sampling and analysis plans were designed to collect sufficient data to calculate site-specific background upper tolerance limits (UTLs). Results of this study are discussed in the January 1995 RFI Report for TA-33, LA-UR-95-882 (LANL 1995, 1212). LANL-wide background UTLs have since become available and are used for comparison purposes in this VCA report. TA-33 UTLs are presented here for information purposes.

2.1.1 Field Investigation for PRS 33-010(a)

PRS 33-010(a) is discussed in the VCA plan and the RFI work plan, Subsections 3.5.2.5 and 4.5.3.1 (LANL 1995, 02-112; LANL 1992, 0784). Much of the debris at this site resulted from 1947 site preparation and consists of dead tree trunks, rocks, and scraped earth. In addition, metal chunks and other debris were thrown over the canyon rim at various times. RFI sampling at PRS 33-010(a) was designed to determine mean contamination using reconnaissance sampling. Field screening did not detect contamination to bias any sample locations. Eight samples were taken on the face of the slope (Fig. 2.1-1). All samples were analyzed for metals, uranium, and cesium-137. Three samples were also analyzed for semivolatile organic compounds (SVOCs) and HE (Table 2.1-1). No debris was sampled. There were no deviations from the approved RFI work plan.

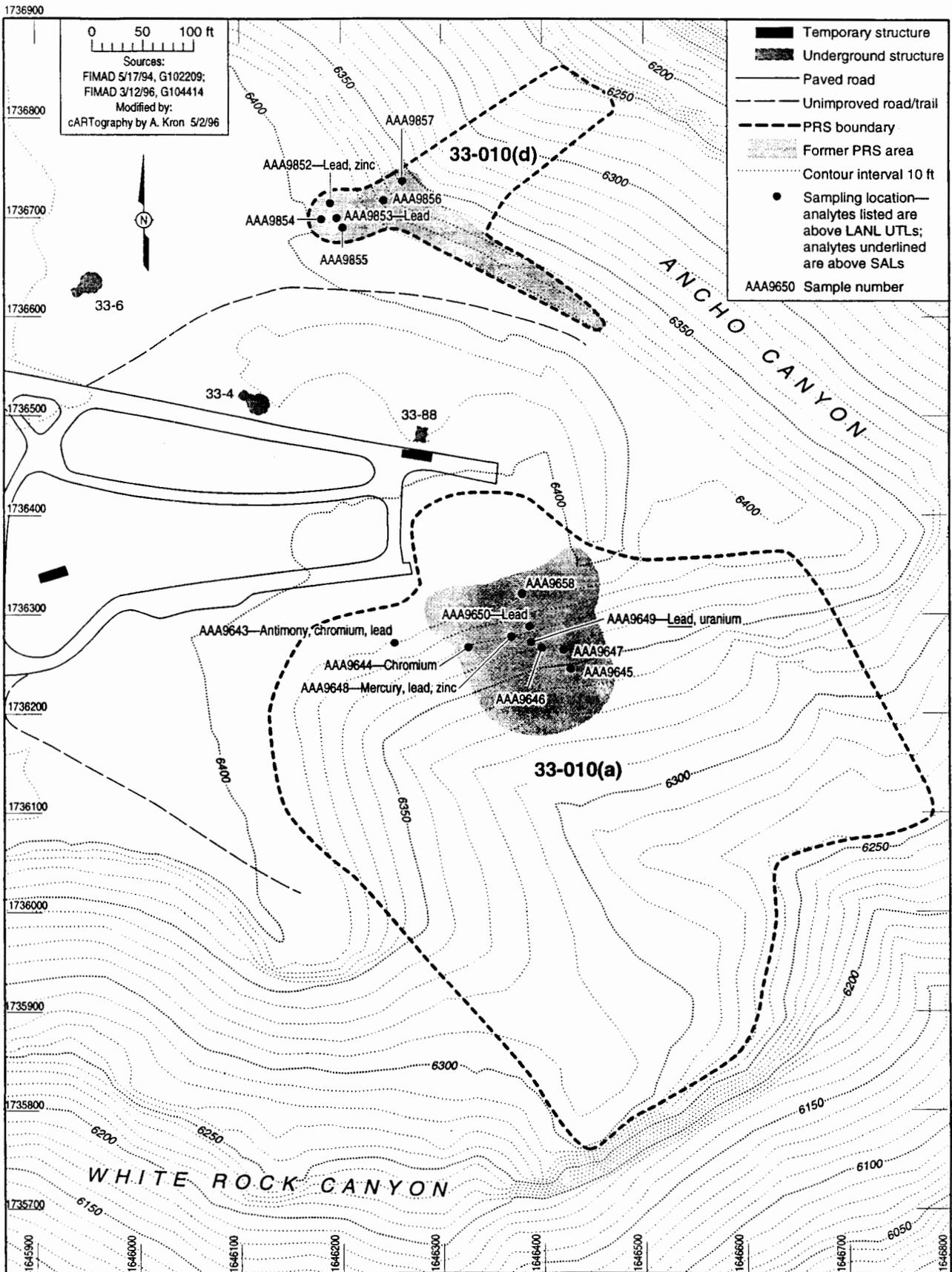


Fig. 2.1-1. New boundaries for PRSs 33-010(a and d).

TABLE 2.1-1
SUMMARY OF SAMPLES COLLECTED FOR PRS 33-010(a)
DURING RFI FIELD INVESTIGATION

SAMPLE ID	SITE ID	DEPTH (in.)	MEDIUM	INOR-GANICS	RADIO-NUCLIDES	SVOCs ^a	HE ^b
AAA9643	33-1392	0-6	Soil	19253 ^c	19358	17674	17676
AAA9644	33-1393	0-6	Soil	19253	19358	17674	17676
AAA9645	33-1394	0-6	Soil	19253	19358	17674	17676
AAA9646	33-1414	0-6	Soil	19258	19957	NA ^d	NA
AAA9647	33-1415	0-6	Soil	19258	19957	NA	NA
AAA9648	33-1416	0-6	Soil	19258	19957	NA	NA
AAA9649	33-1417	0-6	Soil	19258	19957	NA	NA
AAA9650	33-1455	0-6	Soil	19258	19957	NA	NA
AAA9658	33-1317	0-6	Soil	19253	NA	17674	NA

^a SVOCs = Semivolatile organic compounds.

^b HE = High explosives.

^c Indicates ER analytical request numbers.

^d NA = Not analyzed.

2.1.2 Background Comparison

Lead was detected above screening action level (SAL) in one sample. Three samples had uranium above LANL UTLs, but well below SAL. Traces of mercury were found in three samples. Zinc was detected above LANL UTL but below SAL in one sample (Table 2.1-2). No other contaminants were found.

TABLE 2.1-2

INORGANICS DETECTED ABOVE LANL BACKGROUND UTLs AT PRS 33-010(a)

SAMPLE ID	URANIUM (mg/kg)	ANTIMONY (mg/kg)	CHROMIUM (mg/kg)	COPPER (mg/kg)	MERCURY (mg/kg)	LEAD (mg/kg)	ZINC (mg/kg)
SAL ^a	29	31	210	2 800	23	400	23 000
LANL UTL ^b	5.45	2.5	19.3	16.6	0.1	23.3	50.8
TA-33 UTL	4.12	0.27	14.6	N/A ^c	N/A	25.2	57.3
AAA9643	0	6.1 ^d	34.0	NA ^e	<0.02	24	32
AAA9643R ^d	NA	<4.4	32.4	NA	<0.02	26	34
AAA9644	0	<4.6	22.7	NA	<0.05	18	44
AAA9646R	NA	<4.3	5.1	3.9	0.03	7	20
AAA9648	5.46	<4.4	12.8	31.8	0.42	35	204
AAA9649	8.34	<4.9	4.1	6.2	0.13	989^f	26
AAA9650	2.8	<4.3	6.1	<4.7	<0.09	84	40

^a SAL = Screening action level.

^b UTL = Upper tolerance limit.

^c N/A = Not available.

^d R = Replicate sample.

^e NA = Not analyzed.

^f Bold = Value above SAL.

2.1.3 Screening Assessment

Lead was detected above SAL in one sample at 989 mg/kg, but is below the industrial cleanup level of 1 000 mg/kg and will therefore not be carried forward through the screening assessment process.

Other identified analytes greater than Los Alamos National Laboratory (LANL) UTLs were submitted for a multiple chemical evaluation (MCE) for noncarcinogenic group. The sum of the maxima for the noncarcinogenic group of analytes is 0.03. This result is well below the target value of 1, which indicates a very low potential for adverse human health effects due to exposure to these analytes. The results of the MCE are summarized in Table 2.1-3. Only one constituent was detected in each of the carcinogenic (chromium) and radionuclide (uranium) groups. As previously mentioned, all detections were below UTLs; therefore, no MCE has been performed for these groupings.

TABLE 2.1-3

MCE FOR NONCARCINOGENIC EFFECTS AT PRS 33-010(a)

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Mercury	0.42	23	0.018
Zinc	204	23 000	0.009
Total			0.03

2.1.4 Nature And Extent Of Contamination

Biased sampling was performed at this PRS. RFI results indicate that lead was above the SAL but below the industrial cleanup level. The industrial cleanup level for lead is based on an industrial PRG adopted from EPA Region IX and approved by Region VI (EPA 1995, 1307).

2.1.5 Risk Calculations and/or Cleanup Level Derivation

No risk calculations were required for PRS 33-010(a) because the only constituent found above SAL was lead. The concentration of lead found in the soil was 989 mg/kg, which is below the industrial cleanup level of 1 000 mg/kg.

2.2.1 Field Investigation for PRS 33-010(d)

PRS 33-010(d) is discussed in the VCA plan and in the RFI work plan, Subsections 3.5.2.5 and 4.5.3.1 (LANL 1995, 02-112; LANL 1992, 0784). PRS 33-010(d) is a surface disposal area on the rim of Ancho Canyon at East Site. Debris was dumped in a small drainage leading to the canyon. Much of the debris is concrete blocks. At the top of the drainage are empty glass specimen vials. Garbage, such as foam chunks and metal cans, litters the edge of the canyon just below the rim. Sampling at PRS 33-010(d) was designed to detect maximum contamination using reconnaissance sampling. Six surface soil samples were collected, four samples on the mesa amid the debris and two samples in the drainage near the specimen bottles (Fig. 2.1-1). All samples were analyzed for inorganics, uranium, and gamma emitters (Table 2.2-1). No debris was sampled. There were no sampling deviations from the approved work plan.

TABLE 2.2-1
SUMMARY OF SAMPLES COLLECTED FOR PRS 33-010(d)

SAMPLE ID	SITE ID	DEPTH (in.)	MEDIUM	INORGANICS	RADIO-NUCLIDES
AAA9852	33-1422	0-6	Surface soil	17843 ^a	19352
AAA9853	33-1423	0-6	Surface soil	17843	19352
AAA9854	33-1424	0-6	Surface soil	17843	19352
AAA9855	33-1425	0-6	Surface soil	17843	19352
AAA9856	33-1426	0-6	Surface soil	17843	19352
AAA9857	33-1427	0-6	Surface soil	17843	19352

^a ER analytical request number.

2.2.2 Background Comparison

Lead (59 mg/kg) was detected above LANL UTL but far below SAL (Table 2.2-2). No other analyte was detected above UTL.

TABLE 2.2-2
INORGANIC DETECTED ABOVE BACKGROUND UTL AT PRS 33-010(d)

SAMPLE ID	LEAD (mg/kg)
SAL ^a	400
LANL UTL ^b	23.3
TA-33 UTL	25.2
AAA9852	59

^a SAL = Screening action level.

^b UTL = Upper tolerance limit.

2.2.3 Screening Assessment

No analyte was detected above SAL at this PRS.

2.2.4 Nature and Extent of Contamination

RFI results indicate that COPCs in soil were detected above background but well below SAL. No contamination was found in the drainage leaving the PRS.

2.2.5 Risk Calculations and/or Cleanup Level Derivation

No risk calculations or cleanup levels were required for PRS 33-010(d).

2.3.1 Field Investigation for PRS 33-010(g)

PRS 33-010(g) is discussed in the VCA plan and in the RFI work plan, Subsections 3.4.2.8 and 4.4.3.1 (LANL 1995, 02-112; LANL 1992, 0784). PRS 33-010(g) is a canyon-side disposal area located on the steep slope at South Site. Much of the debris at this site results from clearing the site and consists of tree trunks, rocks, and scraped earth. In addition, metal chunks, cable, and other debris were thrown over the canyon rim at various times. Sampling at PRS 33-010(g) was designed to determine the mean constituent concentrations using a reconnaissance sampling approach. Five samples were collected on the face of the slope. Three samples were collected on the mesa (Fig. 2.3-1). No debris was sampled. All samples were analyzed for inorganics, uranium, gamma emitters, and HE. One sample was analyzed for herbicides (Table 2.3-1). There were no deviations from the approved work plan.

TABLE 2.3-1

SUMMARY OF SAMPLES COLLECTED FOR PRS 33-010(g)

SAMPLE ID	SITE ID	DEPTH (in.)	MEDIUM	INORGANICS	RADIO-NUCLIDES	HIGH EXPLOSIVES	HERBICIDES
AAA9804	33-1345	0-6	Soil	19396 ^a	19462	17732	NA ^b
AAA9805	33-1346	0-6	Soil	19396	19462	17732	NA
AAA9811	33-1351	0-6	Soil	19283	19471	17831	NA
AAA9812	33-1352	0-6	Soil	19283	19471	17831	NA
AAA9813	33-1353	0-6	Soil	19283	19471	17831	NA
AAA9814	33-1428	0-6	Soil	19283	19471	17831	NA
AAA9815	33-1429	0-6	Soil	19283	19471	17831	NA
AAA9816	33-1431	0-6	Soil	19283	19471	17831	NA
AAA9817	33-1430	0-6	Soil	19283	19471	17831	17798

^a ER analytical request number.

^b NA = Not analyzed.

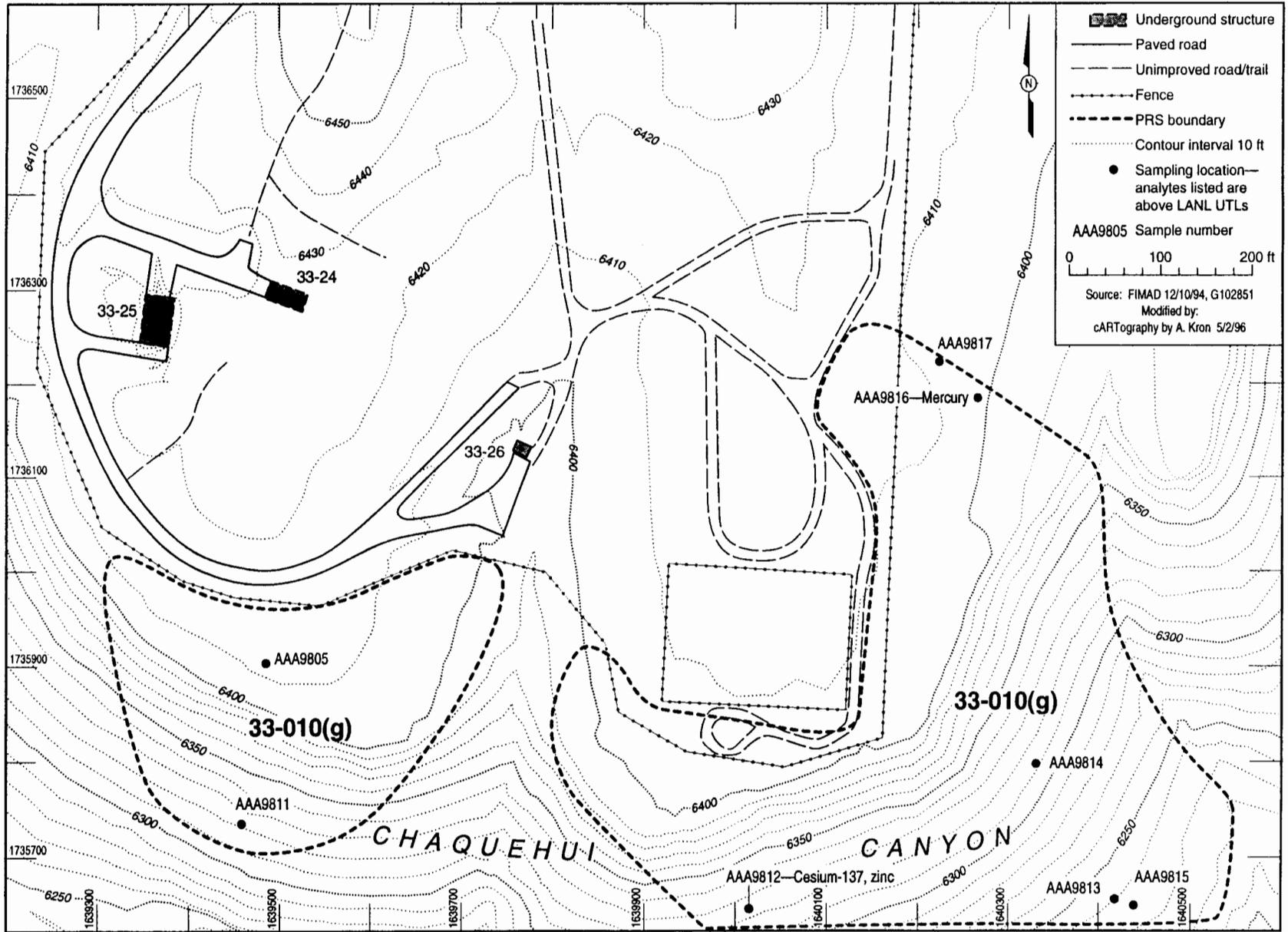


Fig. 2.3-1. Location map of PRS 33-010(g) at South Site.

2.3.2 Background Comparison

Sample AAA9812 contained cesium-137 and zinc above LANL UTLs. Mercury was detected in sample AAA9816 (Table 2.3-2). No other analytes were found above LANL UTLs. No debris was sampled.

TABLE 2.3-2
RADIONUCLIDE AND INORGANICS DETECTED ABOVE BACKGROUND UTLs AT
PRS 33-010(g)

SAMPLE ID	CESIUM-137 (pCi/g)	MERCURY (mg/kg)	ZINC (mg/kg)
SAL ^a	4	23	23 004
LANL UTL ^b	1.4	0.1	50.8
TA-33 UTL	2.068	N/A ^c	57.3
AAA9812	2.085	<0.03	54.2
AAA9816	0.59	0.56	32.4

^a SAL = Screening action level.

^b UTL = Upper tolerance limit.

^c N/A = Not available.

2.3.3 Screening Assessment

No analyte was detected above SAL at this PRS.

2.3.4 Nature and Extent of Contamination

RFI results indicate that COPCs in soil were detected above background but well below SAL.

2.3.5 Risk Calculations and/or Cleanup Level Derivation

No risk calculations or cleanup levels were required for PRS 33-010(g).

2.4.1 Field Investigation for PRS 33-011(b)

PRS 33-011(b) is discussed in the VCA plan and the RFI work plan, Subsections 3.6.2.2 and 4.6.3.1 (LANL 1995, 02-112; LANL 1992, 0784). In the 1950s the area became a principal nonradioactive disposal area at TA-33. It was used to store equipment used at the firing sites and as a holding area for strategic materials such as tungsten, uranium, and beryllium until enough material accumulated to be shipped off site. This site was included in a 1984 cleanup at TA-33 (Buhl 1988, 02-038). Sampling at PRS 33-011(b) was designed to detect maximum

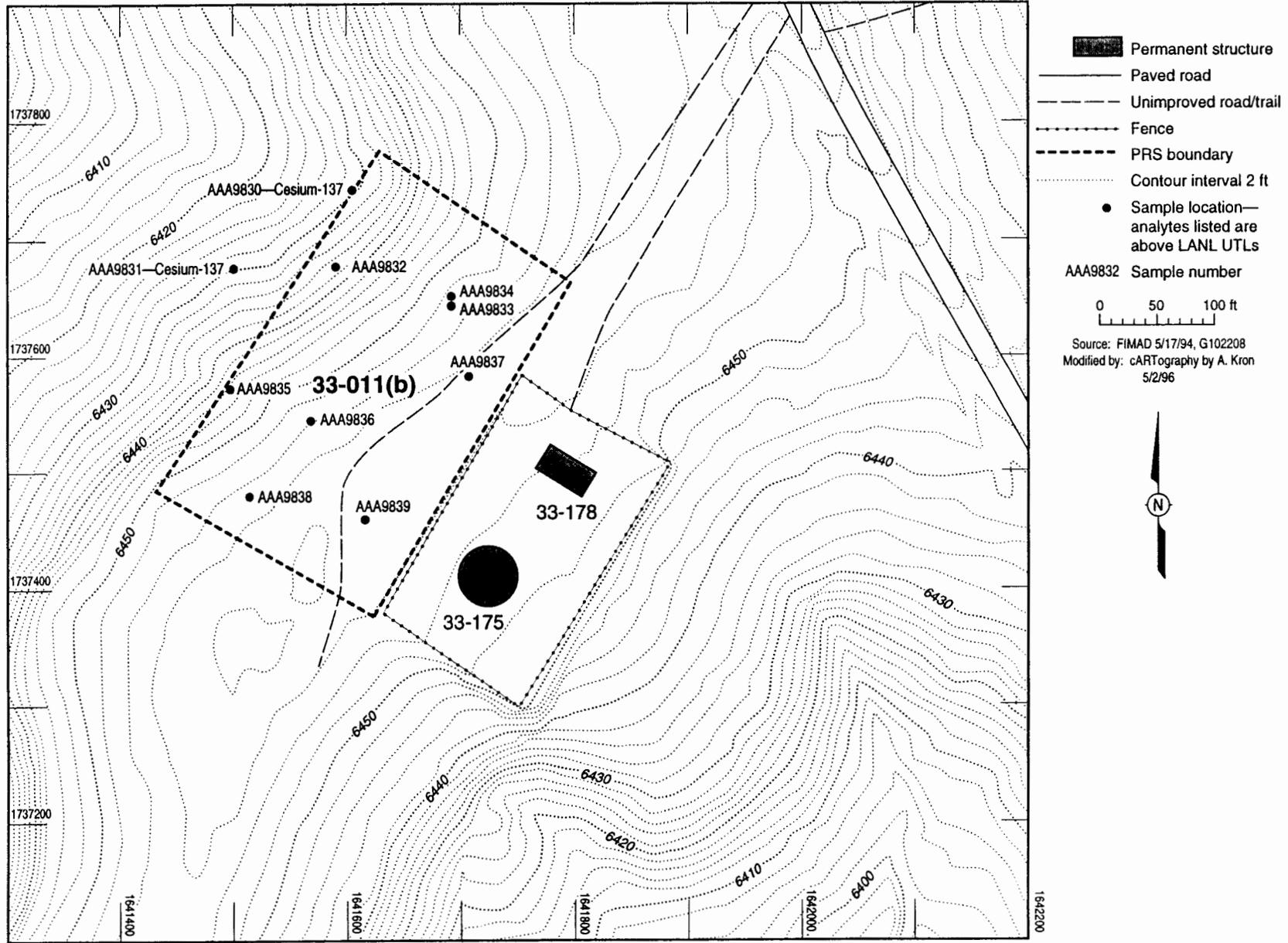


Fig. 2.4-1. Location map of PRS 33-011(b) at NRAO Site.

contamination using reconnaissance sampling. Ten surface soil samples were collected, including four samples in shallow drainages on the slope west of the PRS (Fig. 2.4-1). All samples were analyzed for inorganics, uranium, and gamma emitters. One sample was also analyzed for herbicides (Table 2.4-1). No debris was sampled. During a subsequent site visit, a radioactively contaminated piece of metal debris was found with a Geiger counter. There were no deviations from the approved RFI work plan.

**TABLE 2.4-1
SUMMARY OF SAMPLES COLLECTED FOR PRS 33-011(b)**

SAMPLE ID	SITE ID	DEPTH (in.)	MEDIUM	INOR-GANICS	RADIO-NUCLIDES	HERBI-CIDES
AAA9830	33-1433	0-6	Soil	19255 ^a	19417	NA ^b
AAA9831	33-1434	0-6	Soil	19255	19417	NA
AAA9832	33-1435	0-6	Soil	19255	19417	NA
AAA9833	33-1436	0-6	Soil	19255	19417	NA
AAA9834	33-1471	0-6	Soil	19255	19417	NA
AAA9835	33-1437	0-6	Soil	19255	19417	17897
AAA9836	33-1438	0-6	Soil	19255	19417	NA
AAA9837	33-1439	0-6	Soil	19255	19417	NA
AAA9838	33-1440	0-6	Soil	19255	19417	NA
AAA9839	33-1441	0-6	Soil	19255	19417	NA

^a ER analytical request number.

^b NA = Not analyzed.

2.4.2 Background Comparison

Two samples had cesium-137 levels above LANL UTLs but below the TA-33 UTL for cesium-137 and well below SAL (Table 2.4-2). No other contaminants were found.

TABLE 2.4-2
RADIONUCLIDE DETECTED ABOVE BACKGROUND UTLs AT PRS 33-011(b)

SAMPLE ID	CESIUM-137 (pCi/g)
SAL ^a	5.1
LANL UTL ^b	1.4
TA-33 UTL	2.068
AAA9830	1.938
AAA9831	1.651

^a SAL = Screening action level.

^b UTL = Upper tolerance limit.

2.4.3 Screening Assessment

No analyte was detected above SAL at this PRS.

2.4.4 Nature and Extent of Contamination

RFI results indicate that cesium-137 in soil was detected above background but well below SAL.

2.4.5 Risk Calculations and/or Cleanup Level Derivation

No risk calculations or cleanup levels were required for PRS 33-011(b) because no PCOCs exceeded SALs.

3.0 REMEDIAL ACTIVITIES AND RESULTS OF CONFIRMATORY SAMPLING

3.1 Risk Calculations and/or Cleanup Level Derivation

No cleanup level derivation was necessary for the SWMUs addressed in this report because the lead was the only PCOC greater than SAL but below the industrial cleanup level.

3.2 Remedial Implementation

Debris removal for PRSs 33-010(a, d, and g) and 33-011(b) took place at TA-33 between October 31 and December 9, 1995. The areas remediated are represented in Figures 2.1-1, 2.3-2, and 2.4-1 that show the SWMU boundaries and 1994 RFI sample locations. No confirmatory samples were required during the VCA because no soil removal was performed.

All debris was field screened to detect alpha, beta, and gamma radiation using hand-held ESP instruments in accordance with LANL-ER-SOP-10.07, R0, Field Monitoring for Surface and Volume Radioactivity Levels. All radioactive items were segregated from nonradioactive items at the point of removal from the PRS. Debris was analyzed with x-ray fluorescence (XRF) to verify the presence or absence of hazardous metal constituents in accordance with LANL-ER-SOP-10.08, R0, Operation of the Spectrace 9000™ Field Portable X-Ray Fluorescence Instrument. Debris selected for analysis with the XRF were items that appeared to have been part of an experimental process and were not obvious household waste such as soda cans and food containers, or debris that looked likely to be contaminated (paint, corrosion, ash, etc.). The areas analyzed were selected as areas most likely to contain contaminants (staining, paint, etc.). After screening, the debris was placed in the appropriate waste type group and containerized. Debris that was not removed from the sites included natural materials and objects smaller than three inches in diameter, unless the debris was above radioactive background. Appendix A lists the metal concentrations detected with the XRF and includes the alpha, beta, and gamma radiation readings.

There were three deviations from the VCA plan. The boundaries in which debris was removed at SWMUs 33-010(a and d) were larger than indicated in Fig. 2-2 of the VCA plan. These new boundaries are represented in Fig. 2.1-1 of this report. Waste characterization samples were not collected according to the plan that called for an on-site mobile radiation screening laboratory and mobile chemical screening laboratory. Instead, all debris items were characterized for radioactivity using hand-held alpha, beta, and gamma instruments in accordance with LANL-ER-SOP-10.07, R0. Waste types generated during VCA activities differed from what was projected in the plan and are described below in Section 4.0.

3.3 Confirmatory Sampling

As stated above, no confirmatory sampling was required for SWMUs 33-010(a, d, and g) and 33-011(b) because RFI sampling indicated no risk to human health and the environment from the one constituent found above SAL, i.e., lead.

4.0 WASTE MANAGEMENT

The waste volume estimates given in the VCA plan were greater than the volumes generated during the VCAs; however, in all cases additional waste types were encountered. Unfortunately, the types of wastes generated were combined from all PRSs into the appropriate containers and reported as gross volumes per waste type; therefore, the waste volumes given below in Table 4.0-1 are estimated.

**TABLE 4.0-1
ESTIMATED ACTUAL COMPARED WITH PROJECTED WASTE VOLUMES**

SWMU NUMBER	WASTE TYPE	PROJECTED BULK VOLUME	ESTIMATED ACTUAL VOLUME
33-010(a)	Nonhaz/Nonrad	10 yd ³	8 yd ³
	Hazardous	0.5 yd ³	0 yd ³ ^b
	Radioactive	0 yd ³ ^a	0.2 ft ³
33-010(d)	Nonhaz/Nonrad	6 yd ³	2 yd ³
	Hazardous	0.5 yd ³	0 yd ³ ^b
	Radioactive	0 yd ³ ^a	0.1 ft ³
33-010(g)	Nonhaz/Nonrad	6 yd ³	4 yd ³
	Radioactive	0 yd ³ ^a	2 ft ³
33-011(b)	Nonhaz/Nonrad	6 yd ³	2 yd ³
	Radioactive	0.25 yd ³	0.5 ft ³

^a Not expected.

^b This waste type was not encountered during VCA activity.

Radioactive debris will be disposed at TA-54, Area G by June 31, 1996. The nonradioactive metal will be picked up for recycling by ACE Salvage Company in Albuquerque, New Mexico by May 31, 1996. The remainder of the nonradioactive, nonhazardous materials was taken to the Los Alamos County Landfill on April 8, 1996.

5.0 REFERENCES

Buhl, T.E., June 28, 1988. "Clean-up of Two Firing Site Areas at TA-33," unpublished draft of a report, Los Alamos National Laboratory, Los Alamos, New Mexico. **(Buhl 1988, 02-038)**

EPA (US Environmental Protection Agency), September 1, 1995. "Region IX Preliminary Remediation Goals (PRGs) Second Half 1995," San Francisco, California. **(EPA 1995, 1307)**

Environmental Restoration Project, December 1995. "RFI Report for TA-33, PRSs 33-004(b, c, j, and m), 33-006(a, b), 33-007(a, b), 33-010(a, b, c, d, g, and h), and 33-011(b,c)," Los Alamos National Laboratory Report LA-UR-95-4439, Los Alamos, New Mexico. **(Environmental Restoration Project 1995, 1288)**

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1122," Los Alamos National Laboratory Report LA-UR-92-925, Los Alamos, New Mexico. **(LANL 1992, 0784)**

LANL (Los Alamos National Laboratory), January 1995. "RFI Report for TA-33," Los Alamos National Laboratory Report LA-UR-95-882, Los Alamos, New Mexico. **(LANL 1995, 1212)**

LANL (Los Alamos National Laboratory), December 1995. "Voluntary Corrective Action Plan for Solid Waste Management Units at TA-33; 33-010(a), 33-010(b), 33-010(d), 33-010(g), and 33-011(b)," Los Alamos, New Mexico. **(LANL 1995, 02-112)**

APPENDIX A QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

1. Screening Data
2. Confirmatory Sampling Data - *N/A*
3. Waste Characterization Data- *N/A*

Because no confirmatory sampling or waste characterization data was necessary for the SWMUs addressed in this VCA report, Appendix A includes only screening data (Table A-1). This table lists radioactive screening and x-ray fluorescence data for SWMUs 33-010(a, d, and g) and 33-011(b).

TABLE A-1
SCREENING DATA

PRS	Sample ID	Rad α/β	Rad γ	Ag	As	Ba	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	Mn	Mo	Ni	Pb	Sr	Th	Ti	U	Zn
33-011(b)	011(b) #13	background	background	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2
	001(b) #14	54.0 cpm	50 cpm	ND	ND	ND	ND	ND	4.8	1.5	1.5	ND	ND	3.1	ND	2.8	1	3.4	ND	ND	ND	ND	ND
33-011(b) and 33-010(a)	11.14 #1	background	background	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	2.34
	11.14 #2	background	background	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.7
33-010(g)	010g-1	121 cpm	background	4.9	2.3	0.59	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.1	ND	ND	ND	0.05
	010g-2	1,015 cpm	background	ND	0.35	ND	ND	ND	ND	ND	ND	ND	0.29	ND	ND	ND	ND	ND	0.38	ND	ND	ND	9.64
	010g-3	7,990 cpm	2,500 cpm	0.61	3.17	2.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.68	ND	ND	ND	49.7
	010g-4	138 cpm	background	3.1	5.9	0.24	ND	17.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	010g-5	9,780 cpm	600 cpm	1	ND	ND	ND	3.1	ND	ND	ND	ND	3.3	ND	ND	ND	ND	ND	124.2	ND	ND	ND	0.22
	010g-6	147 cpm	background	ND	ND	0.19	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	30.06	ND	ND	ND	ND
	010g-7	210 cpm	background	0.89	0.66	25.05	ND	0.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13
	010g-8	3820cpm	800cpm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.11
	010g-15	654cpm	150cpm	ND	ND	ND	ND	ND	ND	ND	15.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.21
	010g-16	5180cpm	750cpm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	78.79
	010g-19	16990cpm	2500cpm	ND	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25
	010g-23	949cpm	300 cpm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.71
	010g-27	3150cpm	500cpm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11
	010g-38	14010cpm	8500cpm	ND	ND	ND	ND	ND	ND	ND	2.9	ND	ND	ND	ND	ND	ND	ND	60	ND	ND	ND	29
	010g-42	1917cpm	100cpm	ND	ND	ND	ND	ND	ND	ND	5.8	3.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.8
	010g-48	1424cpm	background	ND	ND	ND	27	ND	35	ND	ND	47.3	ND	16.2	2.5	ND	ND	ND	ND	ND	1.2	ND	58.2
	010g-54	6600cpm	100cpm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28	ND	ND	ND	137.8
	010g-58	528cpm	background	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	010g-59	140cpm	background	ND	ND	ND	37	ND	42	ND	1.3	53.12	ND	20	4	ND	ND	ND	ND	ND	17	ND	79
33-010(a)	010a-10	81.0cpm	background	ND	ND	ND	4.6	ND	1.29	ND	ND	28.8	ND	ND	4	ND	ND	ND	ND	ND	ND	ND	ND
	010a-13	76cpm	background	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND	ND	ND
	010a-14	66cpm	50cpm	ND	1.4	3.6	ND	3	23	ND	ND	ND	ND	ND	ND	ND	ND	87	ND	0.15	83	0.075	ND
	010a-15	59cpm	50cpm	ND	ND	ND	ND	2.4	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND
	010a-16	81cpm	50cpm	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	010a-17	73cpm	25cpm	ND	ND	ND	ND	ND	ND	ND	11.7	ND	ND	ND	1.8	ND	ND	ND	ND	ND	10	ND	ND
	010a-18	86cpm	25cpm	ND	ND	ND	3.7	ND	ND	ND	ND	ND	ND	5.4	5.3	ND	1.2	ND	ND	ND	ND	ND	ND
	010a-19	68cpm	15cpm	ND	ND	ND	5.3	ND	ND	2.8	0.39	ND	4.4	5	ND	ND	ND	ND	ND	ND	ND	ND	0.01
	010a-20	81cpm	background	ND	ND	ND	3.3	ND	1.5	ND	24.1	ND	3	2.4	ND	ND	ND	22	ND	ND	ND	ND	119
	010a-21	58cpm	background	ND	ND	ND	100	ND	3.4	ND	34.4	ND	ND	12.1	ND	ND	ND	10	ND	ND	ND	ND	ND
	010a-22	80cpm	background	ND	1.2	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	4.7
	010a-23	98cpm	background	ND	ND	ND	3.4	ND	1.8	ND	65.8	ND	10.6	3.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
	010a-24	103cpm	background	ND	ND	ND	12.4	ND	21	ND	ND	ND	3.3	ND	ND	ND	ND	360	ND	ND	870	ND	550
	010a-25	450cpm	150cpm	ND	ND	ND	1.9	ND	ND	ND	ND	ND	7.5	ND	ND	ND	ND	ND	ND	0.16	1570	1.8	1229
	010a-26	1800cpm	100cpm	ND	ND	0.24	ND	ND	1.5	ND	30.5	ND	ND	2.6	10	ND	ND	ND	ND	ND	ND	ND	1.4
	010a-27	230cpm	50cpm	ND	ND	ND	ND	2.4	ND	2.4	ND	ND	ND	1.4	ND	ND	ND	16	ND	ND	ND	ND	0.71
33-010(d)	010d-1	1600cpm	50cpm	ND	ND	ND	12	ND	ND	ND	3.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	111	ND

ND = Not detected.

APPENDIX B RAW RFI CHARACTERIZATION DATA

(reduced data for meeting remediation goal)

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

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APPENDIX C BEFORE AND AFTER COST COMPARISON*(for life cycle of remediation, including waste management)***APPENDIX C
COST COMPARISON**

ACTIVITY	PROJECTED COSTS	ACTUAL COSTS
Planning (develop plan and field preparation)	- ^a	\$25 000
Cleanup	\$55 750	\$45 000
Post field operations	- ^a	\$15 000
Disposal	\$4 856	0
Develop VCA Report	- ^a	\$22 400
TOTAL	\$43 656	\$107 400^b

^a Cost not projected in the VCA plan.^b \$77 000 of \$107 400 was for activity not projected in the plan.

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APPENDIX D CONFIRMATORY SAMPLING RESULTS TABLE

Not applicable. No confirmatory samples were required at the SWMUs addressed in this report because no soil removal was performed.

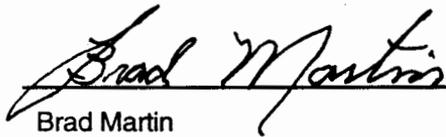
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APPENDIX E CERTIFICATION OF COMPLETION

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CERTIFICATION OF COMPLETION

I certify that all work pertaining to the voluntary corrective action (VCA) 33-010(a) has been completed in accordance with the Department of Energy approved VCA plan entitled **VCA Plan for PRS 33-010(a), Canyon-Side Disposal Area**. Based on my personal involvement or inquiry of the person or persons who managed this clean up, a review of all data gathered and a visit to the site, to the best of my knowledge and belief, all criteria of the plan have been met or exceeded. I believe that the completion of the VCA is both protective to human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Brad Martin

Field Unit 3 Project leader

Environmental Restoration Program

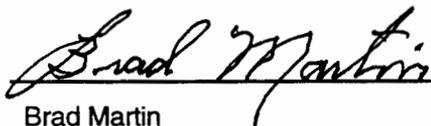
Los Alamos National Laboratory



Date Signed

CERTIFICATION OF COMPLETION

I certify that all work pertaining to the voluntary corrective action (VCA) 33-010(d) has been completed in accordance with the Department of Energy approved VCA plan entitled **VCA Plan for PRS 33-010(d), Surface Disposal Area**. Based on my personal involvement or inquiry of the person or persons who managed this clean up, a review of all data gathered and a visit to the site, to the best of my knowledge and belief, all criteria of the plan have been met or exceeded. I believe that the completion of the VCA is both protective to human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

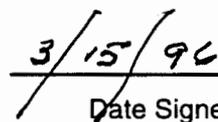


Brad Martin

Field Unit 3 Project leader

Environmental Restoration Program

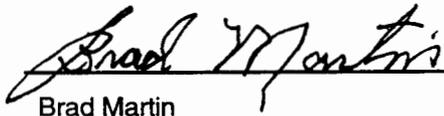
Los Alamos National Laboratory



Date Signed

CERTIFICATION OF COMPLETION

I certify that all work pertaining to the voluntary corrective action (VCA) 33-010(g) has been completed in accordance with the Department of Energy approved VCA plan entitled **VCA Plan for PRS 33-010(g), Canyon-Side Disposal Area**. Based on my personal involvement or inquiry of the person or persons who managed this clean up, a review of all data gathered and a visit to the site, to the best of my knowledge and belief, all criteria of the plan have been met or exceeded. I believe that the completion of the VCA is both protective to human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Brad Martin

Field Unit 3 Project leader

Environmental Restoration Program

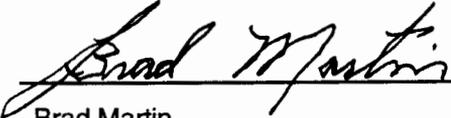
Los Alamos National Laboratory



Date Signed

CERTIFICATION OF COMPLETION

I certify that all work pertaining to the voluntary corrective action (VCA) 33-011(b) has been completed in accordance with the Department of Energy approved VCA plan entitled **VCA Plan for PRS 33-011(b), General Storage Area**. Based on my personal involvement or inquiry of the person or persons who managed this clean up, a review of all data gathered and a visit to the site, to the best of my knowledge and belief, all criteria of the plan have been met or exceeded. I believe that the completion of the VCA is both protective to human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Brad Martin

Field Unit 3 Project leader

Environmental Restoration Program

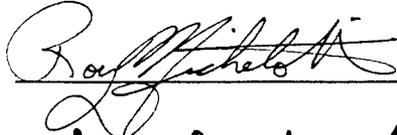
Los Alamos National Laboratory

3/15/96
Date Signed

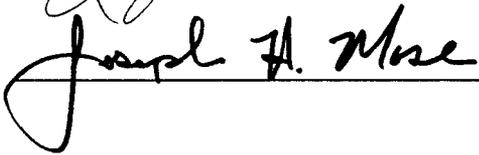
VOLUNTARY CORRECTIVE ACTION (VCA) COMPLETION REPORT
APPROVAL/DISAPPROVAL FORM

PRS(s): 33-010(a,d,g) and 33-011(b)

The undersigned have reviewed the VCA Completion Report and believe that the intent and goals of the VCA plan have been met.

FPL 

Date 6/6/96

FPC 

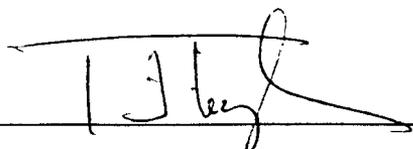
Date 6/10/96

.....

I, Theodore J. Taylor, DOE-LAAO, **APPROVE** the accompanying Voluntary Correction Action Report for PRS(s) 33-010(a,d, g) and 33-011(b), TA-33.

I, Theodore J. Taylor, DOE-LAAO, **DO NOT APPROVE** the accompanying Voluntary Correction Action Report for PRS(s) 33-010(a,d, g) and 33-011(b), TA-33.

The following reasons reflect the decision for disapproval:

Signed: 

Date: 6/12/96