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HSWA LANL 1/1114/3/3-056(c)

Date: October 18, 1999
Refer to: E/ER:99-292

OCT 1999
RECEIVED

Mr. John Kieling
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: SUBMITTAL OF VCA PLAN FOR PRS 3-056(c)

Dear Mr. Kieling:

Enclosed is the Voluntary Corrective Action (VCA) Plan for Potential Release Site (PRS) 03-056(c), a former transformer storage area. This site is included on Table A of the Hazardous and Solid Waste Amendments (HSWA) Module of the Los Alamos National Laboratory's Hazardous Waste Facility Permit.

If you have any questions or concerns please feel free to call Dave McInroy at (505) 667-0819 or Joe Mose at (505) 667-5808.

Sincerely,

Julie A. Canepa, Program Manager
Los Alamos National Laboratory
Environmental Restoration

Sincerely,

Theodore J. Taylor, Program Manager
Department of Energy
Los Alamos Area Office

JC/TT/NR/dm

Enclosure: VCA Plan for PRS 3-056(c)

5591

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LA-UR-99-3928
September 24, 1999

Voluntary Corrective Action Plan for Potential Release Site

03-056(c)

Environmental Restoration Project
A Department of Energy Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY
Los Alamos, NM 87545

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EXECUTIVE SUMMARY

This voluntary corrective action (VCA) plan summarizes the proposed corrective action activities at Los Alamos National Laboratory (LANL) potential release site (PRS) 03-056(c). PRS 03-056(c) was an outdoor storage area that operated from 1967 to 1992. The area was used to store electrical equipment, capacitors, and transformers with dielectric fluids, some of which contained polychlorinated biphenyls (PCBs). Activities within the storage area resulted in the release of PCBs and perchloroethene (PCE) through spills, leaks, and handling practices. As part of the corrective action activity, LANL conducted an expedited cleanup (EC) in which approximately 900 yd^3 of PCB-contaminated soil and debris (some of which also contained PCE) were cleaned up to 10 parts per million (ppm) at the North and West slopes of the site above the Sandia Canyon stream channel.

In August 1995, Environmental Protection Agency (EPA) Region 6 designated a less than 1 ppm PCB cleanup level for this site because the contamination is in or near a watercourse. As a result, LANL will perform additional cleanup activities to meet the cleanup guideline of <1 ppm total PCBs for the site. Because PRS 03-056(c) is included in Table A of the Hazardous and Solid Waste Amendments (HSWA) Module of LANL's Hazardous Waste Facility Permit, remediation and assessment activities will continue to be conducted as part of Resource Conservation and Recovery Act (RCRA) corrective action. Verification sampling and waste management will follow the guidelines in Toxic Substances Control Act (TSCA) 40 Code of Federal Regulations (CFR) 761.

This plan describes the field activities and methods that LANL proposes to use to remove soil and tuff containing 1 ppm or greater total PCBs from the slopes and ephemeral drainages above the active watercourse. VCA activities will include characterizing the site to better define extent, excavating soil and tuff within defined limits to less than 1 ppm total PCBs, conducting confirmation sampling to verify that cleanup is complete, conducting a data assessment to demonstrate an acceptable risk, and designing and installing engineered barriers, erosion control structures and run-on control structures to maintain slope stability and to mitigate residual PCBs (if present) from leaving the site and entering the watercourse. Finally, the VCA plan will discuss waste management and disposal activities related to removal of PCB-contaminated soils from the site.

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VOLUNTARY CORRECTIVE ACTION PLAN FOR POTENTIAL RELEASE SITE 03-056(c)

1.0 INTRODUCTION

This document describes the voluntary corrective action (VCA) to be conducted at potential release site (PRS) 03-056(c) within Technical Area 3 (TA-3) of Los Alamos National Laboratory (LANL). Polychlorinated biphenyls (PCB)-contaminated soils and tuff will be identified, bounded, and removed in accordance with Resource Conservation and Recovery Act (RCRA) corrective actions. Because the PCB-contaminated soil and tuff at the site are considered PCB remediation waste as defined in Toxic Substances Control Act (TSCA) at 40 CFR (Code of Federal Regulations) 761.3, waste management disposal activities will be conducted in accordance with the requirements of 40 CFR 761.61. Remediation activities are scheduled to begin during the fall of 1999. All VCA activities will be conducted by LANL's Environmental Restoration (ER) Project team and its subcontractors. Figure 1.0-1 shows the location of TA-3 relative to other TAs. Figure 1.0-2 shows the location of the PRS within TA-3.

1.1 Purpose and Scope

The objective of the VCA at PRS 03-056(c) is to remove soil and tuff that contain 1 part per million (ppm), or greater, PCBs within previously defined areas: the North Slope, the West Slope, and the ephemeral drainages above the Sandia Canyon watercourse (Figure 1.0-2). The scope of the remediation effort includes the following tasks:

- Conduct initial screening and sampling to better define the limits of PCB-contaminated soil and tuff (equal to or greater than 1 ppm total PCBs) within the three areas described above
- Remove soil and tuff that contain 1 ppm, or greater, total PCBs (where practical and feasible)
- Conduct confirmatory soil and tuff sampling for PCBs to verify that removal activities have met the cleanup levels
- Install run-off control structures to mitigate the possibility of residual PCBs (if present) leaving the remediated area
- Prepare a VCA report that describes all remedial activities at the site (that will be in accordance with LANL guidelines and federal PCB regulations) and report results of the confirmatory sampling and data assessments
- Verify that there is an acceptable risk, leading to a No Further Action (NFA) recommendation for PRS 03-056(c)

The boundaries of the site will determine the extent of the removal. Based on previous investigations, the lateral extent of soils containing 1 ppm or greater PCBs encompasses approximately 50,000 ft^2, or 1.1 acres (Figure 1.0-2). The site is bounded on the south by Building TA-3-223. The north boundary is near the break in slope above the Sandia Canyon watercourse. The west boundary is near the break in the western slope above the Sandia Canyon watercourse. The east boundary is the easternmost ephemeral slope drainage, west of the sludge drying beds. The Sandia Canyon watercourse and banks are not part of the remedial activities. VCA activities will not include removing any PCB-contaminated sediment that may exist in the Sandia Canyon watercourse.

The vertical extent of soil at PRS 03-056(c) varies from a thin veneer to possibly up to 5-ft thick (on the north-west end of Building TA-3-223) overlying Bandelier Tuff. Approximately 900 yd^3 of soil and tuff will be removed during the VCA. Should PCBs extend deeper than the prescribed decision points (refer to

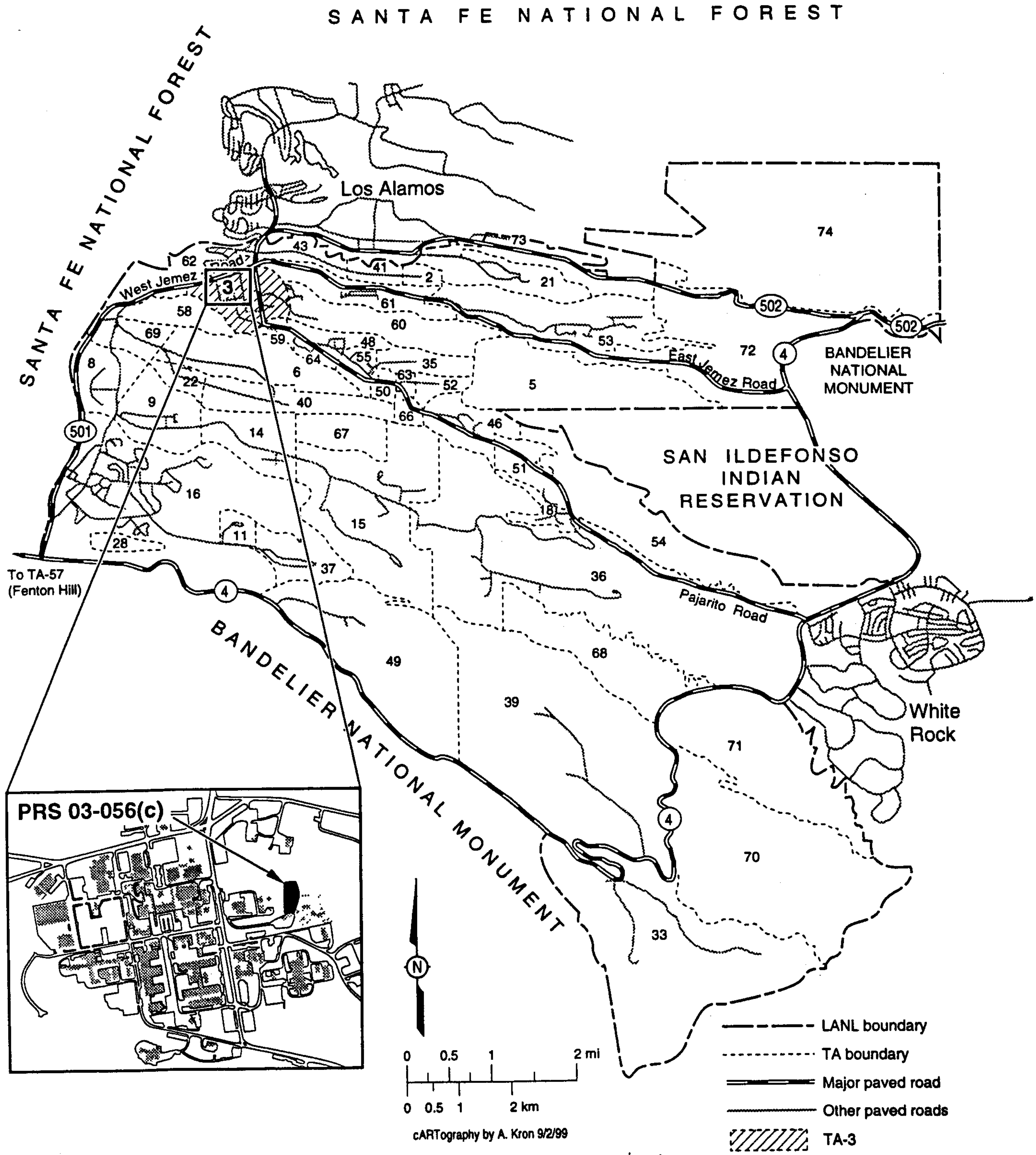


Figure 1.0-1 Location of TA-3 with respect to Laboratory technical areas and surrounding land holdings.

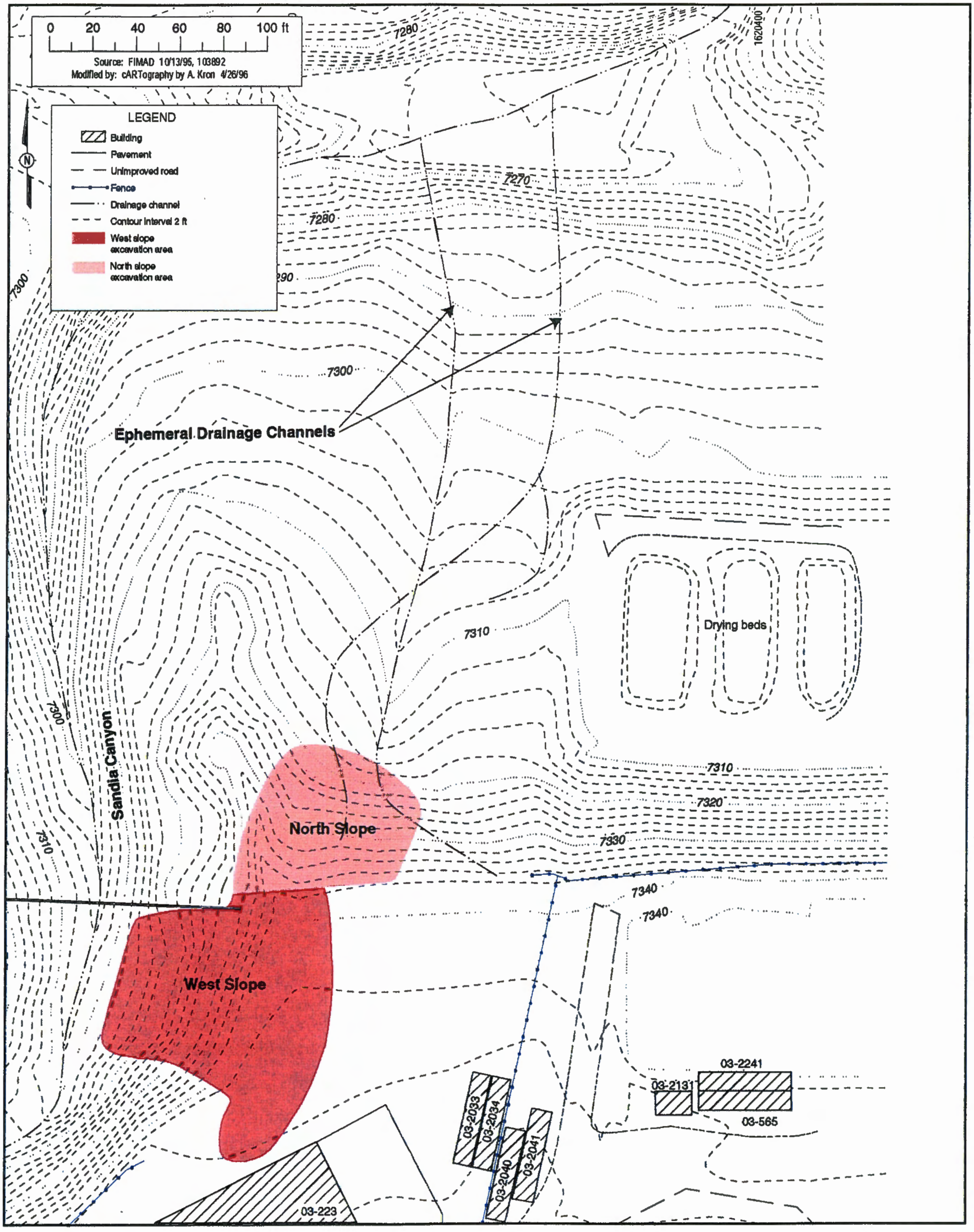


Figure 1.0-2. PRS 03-056(c) including North Slope, West Slope, and ephemeral drainages.

Section 4.3.3), the remedial plan is to assess the concentration and associated risks and either remove tuff or install engineered controls to mitigate PCB migration and potential risks to human health and the environment.

1.2 Regulatory History of PRS 03-056(c)

An expedited cleanup (EC) was conducted in 1995. During this EC, approximately 1000 yd^3 of PCB-contaminated soils were removed from the mesa top and slopes of Sandia Canyon using a cleanup criteria of 10 ppm. Before and during the EC, the Department of Energy (DOE) Los Alamos Area Office (LAAO), LANL ER Project, the US Environmental Protection Agency (EPA), and the New Mexico Environment Department (NMED) participated in discussions regarding the final target cleanup criteria for the site. The final target cleanup level at the site is <1 ppm total PCBs in soils and tuff. Table 1.2-1 contains a chronological list of significant activities at PRS 03-056(c) from 1995 through 1997.

TABLE 1.2-1
HISTORY OF SIGNIFICANT ACTIVITIES AT PRS 03-056(c)

Date	Activity	Synopsis of Correspondence
June 1, 1995	LANL to EPA	EC Plan for PRS 03-056(c) submitted to EPA
August 9, 1995	EPA	EPA commented on EC Plan with notice of deficiency (NOD); disagreed with 10 ppm cleanup level, proposed a more stringent cleanup level
August 1995–March 1996	LANL	Conducted remedial activities: 1000 yd^3 of soil containing >10 ppm total PCBs removed from slopes and mesa top LANL performed human health and ecological risk assessment to support the decision to leave <10 ppm PCBs on site
December 6, 1995	LANL to EPA	LANL submitted status report to EPA on reproposed 10 ppm cleanup level
March 13, 1996	NMED to LANL	NMED submitted NOD on status report; requested justification for 10 ppm cleanup level
May 2, 1996	LANL to NMED and EPA	LANL submitted responses to NOD, with copies to EPA TSCA
November 6, 1996	LANL	ER Project indicated that no further action can be pursued until a cleanup level is agreed upon
June 10, 1997	EPA to DOE	EPA Region 6 TSCA provided documentation of the clean up level (<1 ppm)

1.3 Rationale for Proposed Corrective Action

The rationale for conducting the corrective action at PRS 03-056(c) is to meet the EPA cleanup requirements of <1 ppm for PCBs and to propose the site for NFA. The EPA cleanup level at the site is <1 ppm for PCBs. Following the corrective action, a data assessment will be performed to determine whether residual contamination poses an acceptable level of risk under current and projected future land use. If the determination is made that an acceptable level of risk has been reached, the site will be proposed for human health and ecological NFA under Criterion 5 following the Installation Work Plan (IWP) guidance (LANL 1998, 62060). Once approved for NFA, the site will be included in a Class III permit modification requesting removal from the HSWA Module of LANL's Hazardous Waste Facility Permit.

2.0 PREVIOUS SITE CHARACTERIZATION OF PRS 03-056(c)

2.1 Site Description and Operational History

PRS 03-056(c) is located on Sigma Mesa, on the southern flank of Sandia Canyon, in Los Alamos County, New Mexico. The prevalent soil type on the mesa top is Carjo loam, which consists of moderately deep, well-drained soils that formed in material weathered from Bandelier tuff. The Carjo loam exists as a thin veneer ranging in thickness from a few inches to 3.5 ft at this site. Pleistocene ash flows of the Bandelier Tuff directly underlie the Carjo loam. The depth to the regional aquifer is estimated to be 950–1200 ft below ground surface (LANL 1996, 55746). PRS 03-056(c) lies entirely on US DOE land and is isolated from public access roads. Based on current LANL land-use planning, LANL will continue to use the property for industrial purposes (LANL 1995a, 57224).

As a result of previous investigations conducted at PRS 03-056(c), the site has been divided into three areas: the West Slope, the North Slope, and ephemeral drainages. The West Slope is approximately 130 ft by 70 ft and slopes steeply to the west at a grade of approximately 30°–80°. The North Slope is north-east of the West Slope. This area is approximately 70 ft by 70 ft and slopes to the north at a grade of approximately 28°. The third area encompasses two small, poorly defined ephemeral drainages that run north from the base of the North Slope to the Sandia Canyon watercourse. The small drainages traverse a heavily forested and vegetated area that slopes to the north at a grade of approximately 10°.

PRS 03-056(c) is an inactive outdoor storage area located on the north side of Building TA-3-223 (Figure 1.0-2), a utilities shop. The PRS occupies an area that extends along the length of TA-3-223 and is bounded by a security fence and TA-3-223 to the south. According to previous interviews with Johnson Controls Incorporated (JCI) electrical maintenance personnel at Building 223, the outdoor storage area was used for storing electrical equipment, capacitors, and transformers with PCB-containing dielectric fluids (LANL 1995b, 52951.40). Also, waste solvents were reportedly stored there in unmarked drums from 1967 to approximately 1992. The types of solvents used to clean electrical equipment and stored at the site may have included an unknown solvent from 1967 to approximately 1981 and Viking R30 (trichloroethane) from 1981 to 1990. Beginning in 1990 and continuing through 1992, a nonhazardous citrus-based solvent was used as a substitute for solvent-based cleaners. Transclene, which contains perchloroethene (PCE), may have been stored at the site because it was used by an electrical equipment maintenance subcontractor to retrofill transformers in the field. It is believed that the maintenance crew disposed of all these waste materials at an approved waste disposal facility. In 1991, the site's facility managers placed approximately 1–2 ft of clean fill on the area occupying the former storage area to elevate it and to reroute run-on drainage away from this site. In 1992, the PRS 03-056(c) storage area was decommissioned (LANL 1995b, 52951.40).

2.2 Previous Field Investigations

Previous work consists of investigations in 1991 and 1994 (pre-excavation) and an EC investigation conducted in 1995 (post excavation). These investigations are discussed below.

2.2.1 Pre-Excavation

Previous investigations were conducted at PRS 03-056(c) to determine the residual PCBs at the site (LANL 1996, 55746). In November 1991, five surface soil samples were collected along the perimeter fence of TA-3-223 by Environmental Management 8 (EM-8) personnel. This was part of an interim action reconnaissance survey preceding a slope stabilization project. A 1994 investigation was conducted as part of a RCRA Facility Investigation (RFI). A total of 22 soil samples were collected from 18 locations at depths ranging from 0 to 3 ft below grade. Samples were submitted to a fixed laboratory for one or more of the following analyses: metals by EPA SW 846 Methods 6010/6020/7421, PCBs/pesticides by EPA Method 8080, semivolatile organic compounds (SVOCs) by EPA SW 846 Method 8270, and volatile organic compounds (VOCs) by EPA Method 8260. Twenty-two samples were submitted for metals analysis, 13 samples were submitted for PCB/pesticide/SVOC analyses, and 11 samples were submitted for VOC analysis (LANL 1996, 55746).

2.2.2 EC and Post-Excavation

In August 1995, the site was further characterized as part of an EC to identify the lateral extent of soils containing residual PCBs (LANL 1996, 55746). The 1994 pre-excavation sampling indicated that metals, SVOCs, pesticides, and VOCs, including PCE, were below SALs outside the boundary of the excavation area (LANL 1996, 55746); therefore, only PCBs were investigated further. Ten samples were initially collected from the West Slope area to better define the lateral extent of PCB contamination. A 45-ft-diameter area was initially mapped to represent the area of suspected contamination. A 10-ft-by-10-ft grid was placed over the area of suspected contamination, and soil samples were collected within grid nodes in order to provide a statistically defensible sampling approach (acceptable by EPA) for proceeding with remediation. The grid samples were analyzed for PCBs by a fixed laboratory using EPA SW-846 Method 8080. The results of the grid sampling effort were used to target areas for soil excavation. During excavation activities, the lateral extent of soil contamination was further defined to encompass an area approximately 130 ft long by 70 ft wide. To verify that the proposed 10 ppm cleanup level had been met during this excavation, a verification sampling location grid was laid out on the West Slope and divided into four composite zones. Samples were collected within these zones in accordance with "Verification of PCB Spill Cleanup by Sampling and Analysis" (EPA 1995, 08026.1). Composites with either nine or ten grid location samples were collected within the zones and submitted for fixed-laboratory analysis of PCBs using EPA SW-846 Method 8080. (See Figure 2.2-1 for composite locations and Figure 2.2-2 for actual sample locations.) Vertical bounding samples were not collected.

As sample analyses revealed PCBs in the soil, the West Slope excavation area was expanded in a northerly direction along the mesa edge. Additional site characterization samples were collected in the North Slope area (LANL 1996, 55746). The soil samples from the North Slope were analyzed for PCBs by EPA SW-846 Method 8080. PCB-contaminated soil was excavated from an area approximately 60 ft long by 70 ft wide. To verify that the proposed 10 ppm cleanup level had been met, a verification sampling location grid was laid out on the North Slope and divided into four composite zones, in accordance with EPA guidance (EPA 1985, 08026.1). Composite samples were collected from within the zones and analyzed for PCBs using EPA SW-846 Method 8080. (See Figure 2.2-1 for composite zones and Figure 2.2-2 for actual sample locations.) Vertical bounding samples were not collected.

Three soil samples were collected from the ephemeral slope drainages, downslope from the North and West slope remedial areas. The samples were analyzed for PCBs by EPA SW-846 Method 8080. Four sediment samples were collected from the watercourse downstream of PRS 03-056(c) in Sandia Canyon. The samples were analyzed for PCBs by EPA SW-846 Method 8080.

2.3 Results of Previous Investigations

2.3.1 Pre-Excavation Sampling Results

During the November 1991 investigation, four of the five soil samples collected from the storage area had concentrations of total PCBs greater than 1 ppm and less than 10 ppm. The fifth sample contained 9600 ppm PCBs. Mercury was present at 0.471 ppm, below the screening action level (SAL) for mercury, 24 ppm (LANL 1993, 20947).

PCBs were detected during the 1994 investigation at concentrations from <1 ppm to 9600 ppm at depths ranging from ground surface to 1.5 ft. Concentrations decreased with depth. Mercury was detected in three samples at levels ranging from 0.04 ppm to 1.7 ppm. All mercury results were below the SAL of 24 ppm. PCE was detected in two samples at concentrations up to 0.044 ppm, which is also below the

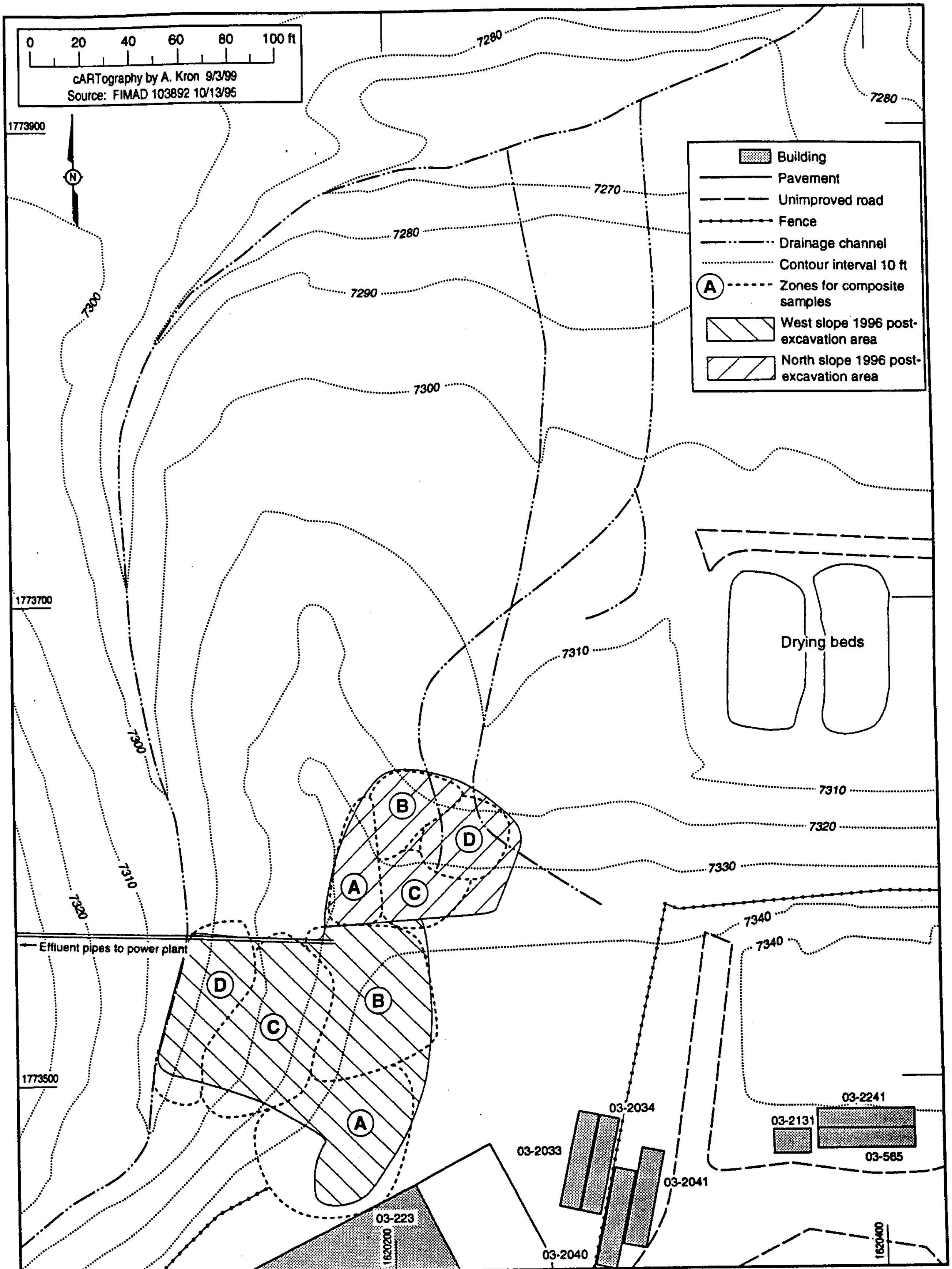
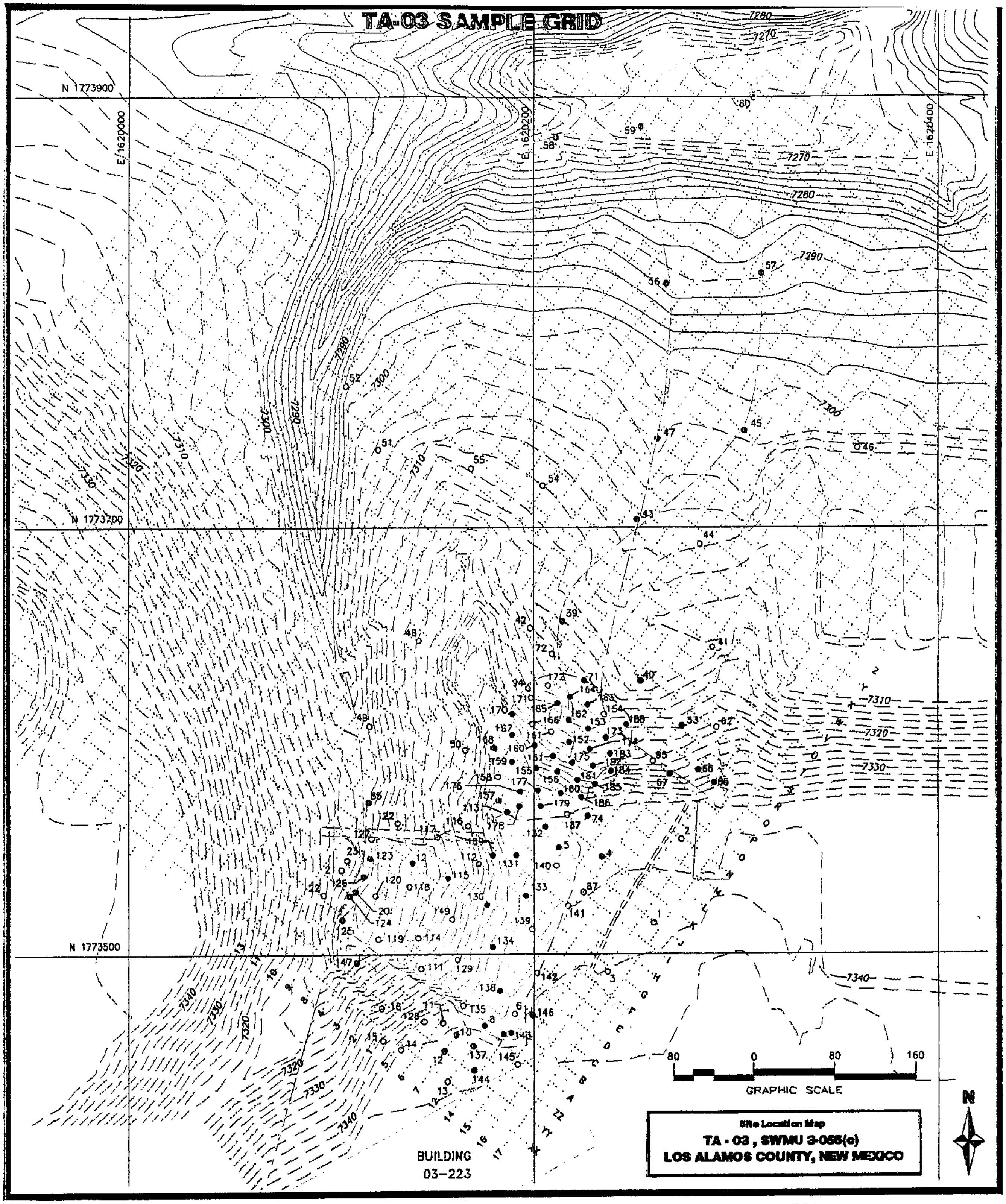


Figure 2.2-1. 1996 EC post-excavation composite locations at PRS 03-056(c).



LEGEND:

- Excavation limits
- Drainage channel
- Effluent pipe
- Edge of pavement
- Chain link fence line
- Stormwater diversion trench
- PCB concentration below 1 ppm, field laboratory
- PCB concentration above 1 ppm, fixed laboratory
- Sample grid

GENERAL NOTES:

1.) Contour interval = 2 feet.

2.) Contour data is based on a composite of survey data from SURV-TEX Inc. and countour data from FIMAD.

3.) Information on this map is provisional and their accuracy has not been confirmed.

4.) Grid provides NM State Plane Coordinates in ft.
Grid interval = 200 ft.
NAD 83, NM Central Zone

Figure 2.2-2. 1996 EC post-excavation sampling locations at PRS 03-056(c).

SAL of 4.7 ppm. The samples collected from the drainages contained concentrations of PCBs greater than 1 ppm.

2.3.2 Post-Excavation Sampling Results

Analytical results from the 1995 composite verification samples collected after the EC on the West Slope indicated that PCB concentrations in zones A and B (composites of nine and ten samples, respectively) exceeded the 10 ppm clean-up criteria. This is based on compositing strategy calculations stipulated in "Verification of PCB Spill Cleanup by Sampling and Analysis" (EPA 1985, 08026.1). PCB concentrations in zones C and D (composite of nine samples each) were determined to be below the 10 ppm criteria based on compositing strategy calculations stipulated. Additional samples were collected at each individual sample location in zones A and B, and analytical results indicated that 16 of the 19 samples contained concentrations of PCBs less than 10 ppm, and 7 of these samples contained concentrations of PCBs at less than 1 ppm (LANL 1996, 55746). Table 2.3-1 presents the available results for samples collected in the composite zones. Figures 2.2-1 and 2.2-2 show locations of composite zones and samples.

Analytical results of the 1995 composite verification samples collected on the North Slope indicated that PCB concentrations in all four of the composite zones (A, B, C, and D) exceeded the 10 ppm criteria based on compositing strategy calculations stipulated (EPA 1985, 08026.1). Individual samples from each location were then analyzed to isolate those areas with the highest PCB concentrations. The analytical results for the individual samples indicated that 37 of the 50 locations contained PCBs at concentrations less than 10 ppm, and 9 of these samples contained concentrations of PCBs at less than 1 ppm (LANL 1996, 55746). One of the individual results exceeded the criteria of 50 ppm total PCBs. Table 2.3-2 presents the available results for samples collected in the composite zones. Figures 2.2-1 and 2.2-2 show locations of composite zones and samples.

TABLE 2.3-1
POST-EXCAVATION VERIFICATION SAMPLE RESULTS FROM WEST SLOPE

Composite Zone	Map Location (from Figure 2.2-2)	Sample Date	Sample Number	Total PCBs (ppm)
A	*	1/15/96	0103-96-0048	0.042
A	137	1/15/96	0103-96-0049	2.8
A	*	1/15/96	0103-96-0050	0.97
A	143	1/15/96	0103-96-0051	6.0
A	138	1/15/96	0103-96-0052	3.4
A	*	1/15/96	0103-96-0053	0.09
A	146	1/15/96	0103-96-0054	34.0
A	144	1/15/96	0103-96-0055	2.1
A	*	1/15/96	0103-96-0056	0.06
B	130	1/15/96	0103-96-0058	13.0
B	131	1/15/96	0103-96-0059	2.1
B	133	1/15/96	0103-96-0060	4.0
B	**	1/15/96	0103-96-0061	0.15
B	**	1/15/96	0103-96-0062	0.0
B	132	1/15/96	0103-96-0063	3.8
B	113	1/15/96	0103-96-0064	13.0
B	**	1/15/96	0103-96-0065	0.24
B	134	1/15/96	0103-96-0066	2.1
B	5	1/15/96	0103-96-0067	8.2
C	85	1/15/96	n/a	1.6
C	122	1/15/96	3-3122***	<1

TABLE 2.3-1 (Continued)
POST-EXCAVATION VERIFICATION SAMPLE RESULTS FROM WEST SLOPE

Composite Zone	Map Location (from Figure 2.2-2)	Sample Date	Sample Number	Total PCBs (ppm)
C	127	1/15/96	3-3127***	<1
C	123	1/15/96	3-3124***	1.4
C	126	1/15/96	3-3126***	1.7
C	20	1/15/96	n/a	1.7
C	125	1/15/96	3-3125***	1.6
C	23	1/15/96	n/a	<1
C	120	1/15/96	3-3120***	<1
D	12	1/15/96	n/a	3.9
D	118	1/15/96	3-3118***	<1
D	149	1/15/96	3-3149***	<1
D	114	1/15/96	3-3114***	<1
D	111	1/15/96	3-3111***	<1
D	112	1/15/96	3-3112***	<1
D	117	1/15/96	3-3117***	<1
D	119	1/15/96	3-3119***	<1
D	147	1/15/96	3-3147***	1.8

* Map location number 129, 135, 139, or 142
** Map location number 140, 141, or 87
*** FIMAD sample number unknown
n/a FIMAD location number not available

Note: The actual samples in composites C and D are approximated (results and locations on map are correct)

TABLE 2.3-2
POST-EXCAVATION VERIFICATION SAMPLE RESULTS FROM NORTH SLOPE

Composite Zone	Map Location (from Figure 2.2-2	Sample Date	Sample Number	Total PCBs (ppm)
A	170	2/1/96	0103-96-0074	1.7
A	115	2/1/96	0103-96-0076	1.7
A	168	2/1/96	0103-96-0077	22.0
A	169	2/1/96	0103-96-0087	2.0
A	178	2/1/96	0103-96-0094	8.5
A	156	2/1/96	0103-96-0096	20
A	*	2/1/96	0103-96-0098	0.38
A	157	2/1/96	0103-96-0099	1.6
A	159	2/1/96	0103-96-0100	19
A	167	2/1/96	0103-96-0101	3.9
A	*	2/1/96	0103-96-0107	0.98
B	164	2/1/96	0103-96-0068	9.4
B	165	2/1/96	0103-96-0069	7.2
B	163	2/1/96	0103-96-0070	14.0
B	**	2/1/96	0103-96-0071	0.36
B	**	2/1/96	0103-96-0072	0.68
B	162	2/1/96	0103-96-0075	47.0
B	**	2/1/96	0103-96-0078	0.83
B	160	2/1/96	0103-96-0079	8.8

TABLE 2.3-2 (Continued)
POST-EXCAVATION VERIFICATION SAMPLE RESULTS FROM NORTH SLOPE

Composite Zone	Map Location (from Figure 2.2-2	Sample Date	Sample Number	Total PCBs (ppm)
B	**	2/1/96	0103-96-0080	0.09
C	151	2/1/96	0103-96-0083	5.4
C	186	2/1/96	0103-96-0088	1.4
C	180	2/1/96	0103-96-0089	13.0
C	181	2/1/96	0103-96-0090	6.0
C	179	2/1/96	0103-96-0091	4.8
C	176	2/1/96	0103-96-0092	4.5
C	187	2/1/96	0103-96-0093	0.38
C	177	2/1/96	0103-96-0095	12
C	188	2/1/96	0103-96-0097	30
C	185	2/1/96	0103-96-0102	12
D	154	2/1/96	0103-96-0073	0.29
D	183	2/1/96	0103-96-0081	1.0
D	175	2/1/96	0103-96-0082	2.3
D	153	2/1/96	0103-96-0084	2.8
D	***	2/1/96	0103-96-0085	2.8
D	173	2/1/96	0103-96-0086	3.5
D	182	2/1/96	0103-96-0103	63
D	184	2/1/96	0103-96-0104	7.0
D	174	2/1/96	0103-96-0105	10
D	155	2/1/96	0103-96-0106	30
NC	***	3/22/96	0103-96-0111	3.9
NC	***	3/22/96	0103-96-0112	15
NC	***	3/22/96	0103-96-0113	15
NC	***	3/22/96	0103-96-0114	7.8
NC	***	3/22/96	0103-96-0115	3.0
NC	***	3/22/96	0103-96-0116	1.2
NC	***	3/22/96	0103-96-0117	4.2
NC	***	3/22/96	0103-96-0118	0.93
NC	***	3/22/96	0103-96-0119	2.5
NC	***	3/22/96	0103-96-0120	4.0

NC = Non-composite samples collected after expanding the north slope verification grid in an attempt to reestablish the extent of the 10 ppm contour at this location

* Map location number 116 or 158
** Map location number 161, 166, 171, or 172
*** Map location number unknown

3.0 BASIS FOR CLEANUP LEVELS

Per direction from EPA Region 6 TSCA PCB Program Office, the clean-up level for the site is 1 ppm PCBs because it is located in or near a watercourse.

4.0 PROPOSED CORRECTIVE ACTION

4.1 Conceptual Model

The conceptual model embodies all current understanding and best scientific expectations/judgment for describing contaminant distribution, migration, fate, and exposure as affected by site physical properties and environmental conditions. It comprises the assumptions used to guide the VCA activities and cleanup design.

The conceptual model provides an understanding of

- The distribution of the contaminants
- The potential contaminant pathways and transport mechanisms
- The potential contaminant exposure pathways to receptors

4.1.1 Distribution of Contaminants

Based on the operational history of PRS 03-056(c) and results of the previous sampling and analyses, PCBs are determined to be the major contaminant of concern at this PRS. PCBs are currently present at concentrations up to 63 ppm and are present in the soil and tuff. Other organics and inorganics, specifically PCE and mercury, were found not to be present at elevated concentrations (LANL 1996, 55746). The soil ranges in thickness from zero to approximately 5 ft thick across the site. PCB-contaminated soil has been detected in the sediment associated with Sandia Canyon to the north of the site. Sandia Canyon is not part of the VCA and is being addressed by the LANL ER Remedial Action Focus Area as part of TA-3.

4.1.2 Potential Contaminant Transport Pathways

The most important processes for transport and partitioning of PCBs in soil is adsorption, which is controlled primarily by the organic carbon content of the medium in which the PCBs are found. In soils with very low organic content, such as those present at PRS 03-056(c), the clay content and the degree of chlorination of the PCB compound(s) controls the absorption characteristics. PCBs tend to be tightly adsorbed to soil particles due to their low water solubility and high octanol-water partition coefficients. Sorption of PCBs in soil increases as organic matter and clay content increase. Therefore, leaching is expected to be greatest from soils with low organic carbon or clay content. However, the longer the PCB constituents remain in contact with particulate matter, the more they are bound to the soil, the less readily they are desorbed, and the less leachable and mobile they become (Alexander 1995, 63536). Due to the age of the release, the PCBs at PRS 03-056(c) are expected to be strongly bound to soil or tuff.

Based on the sorptive characteristics of PCBs, the primary mechanism for contaminant transport is erosion of contaminants bound to the soil surface via snowmelt, rainfall, and surface water run-off. Stormwater run-off will also transport PCBs that are adsorbed to soil particles. The surface water assessment conducted for PRS 03-056(c) generated an erosion matrix score (EMS) of 69.7, indicating a potential for erosion and contaminant migration to occur at the site. However, best management practices (BMPs) are in place at the site to minimize any potential migration of contaminants.

A secondary transport mechanism is contaminant transport as fugitive dust. This mechanism is unlikely as the site is heavily vegetated, and matting is lain over the slopes to minimize generation of fugitive dust.

Another possible transport mechanism is volatilization from soil to air. The volatilization rate is partly dependent on organic carbon and clay content of the soil but is dominated by the vapor pressure. Volatilization is more likely in soils with low organic carbon because sorption of PCBs to these soils is weaker (ATSDR 1995, 63537). The volatilization rate of PCBs from contaminated tuff and soil at PRS 03-056(c) is expected to be minimal due to the low vapor pressure of PCBs.

The bedrock at this site is comprised of Bandelier Tuff (ATSDR 1995, 63537). The possibility exists that PCB-contaminated soils have migrated downward into fractures and joints. The bedrock is unsaturated and does not provide a migration pathway for PCBs into the regional aquifer, which lies 950–1200 ft below land surface. In addition, the low solubility and mobility of PCBs further reduce the downward migration potential of PCBs through bedrock.

4.1.3 Potential Contaminant Exposure Pathways to Receptors

4.1.3.1 Potential Human Health Exposure Pathways

The plausible receptor for human exposure is the industrial worker. Worker exposure during remediation is addressed in the site-specific health and safety plan. At PRS 03-056(c), the primary exposure pathways would be incidental ingestion of soil and inhalation of contaminated particulates. Dermal exposure to PCBs could also be of concern. Because of the low levels of PCBs at PRS 03-056(c) and the fact that PCBs are not easily released from soils, dermal exposure is not included. Its contribution to exposure would be at least one order of magnitude less than exposure from inhalation or ingestion.

4.1.3.2 Potential Ecological Exposure Pathways

Ecological receptors with potential exposure to PCBs at PRS 03-056(c) include, but are not limited to, deer, elk, ground-dwelling and burrowing small mammals, wide-ranging carnivorous mammals, resident and transient avian species, and many species of invertebrates. A number of trophic levels are represented by these receptors, and the potential for complete food web transport pathways exists. Under current conditions, before the VCA, receptors may be potentially exposed to PCBs through the following complete pathways:

1. Incidental ingestion of soil by foraging animals
2. Food web transport via ingestion of contaminated soil, contaminated plants, or prey
3. Inhalation of dust generated by wind or by foraging and burrowing
4. Plant exposure to PCBs from surface splash or root uptake
5. Transport of contaminated soil to aquatic ecological communities
6. Mass wasting as a potential release mechanism for subsurface material

The exposure pathways described in 1, 2, and 3 will become incomplete upon removal of the contaminated soil from the site and the placement of engineering controls at the site. The surface splash element of pathway 4 will be eliminated with the removal of soil. Although it is possible that some plant roots may invade cracks or crevices in the tuff, it is not expected that root uptake by these plants will present a significant exposure pathway either for the plants or as primary elements in food web transport. Pathway 5 will be interrupted with the removal of contaminated soil, the installation of the erosion control measures in the drainage pathways, and the rerouting of surface water run-on to inhibit run-off from the site. Pathway 6 will be mitigated by placing an asphalt cover over the storage area, where mass wasting has the potential to occur.

Because of the proposed VCA, the exposure pathways that are currently complete will no longer provide means for PCB exposure to ecological receptors within the bounds of the site.

In addition, an ecological pathways conceptual exposure model (CEM), which specifically addresses the potential exposure pathways for ecological receptors, is included in Appendix D, as an element of the ecological scoping checklist prepared for the site (LANL 1999, 63303). After successful implementation and completion of the VCA, it is not likely that any complete PCB exposure pathways for ecological receptors will remain within PRS 03-056(c).

4.2 Supplemental Sampling

Supplemental, or pre-excavation, sampling will be conducted to determine the extent of PCB-contaminated soil and tuff within the defined boundaries of the site and to determine a correlation between field screening results and fixed-laboratory results for PCB analysis. Results from the supplemental sampling will determine the lateral extent of soil that needs to be excavated. Results from the correlation study will provide a better understanding of the sensitivity and accuracy of the immunoassay field test kits and will guide the use of field screening during the confirmation sampling.

The intent of the sampling is to characterize and estimate the limits of the existing contamination. The sampling will be biased to those areas that are most likely to contain PCBs. These include the bordering areas of known contamination and topographic lows within soil and fractured tuff that are most likely to receive input from surface water run-off. Best professional judgment will be used to determine the sample locations in the field. This sampling approach will bias the results on the high side and will be useful in determining the lateral extent of contaminated mass. Field screening will be used to direct the laboratory sampling. Details are discussed below.

4.2.1 Field Screening

The sampling strategy uses a biased approach that extends beyond the current boundaries of known contamination and is designed to achieve a 95% upper confidence level. Samples will be collected at approximate 30-ft intervals and will cover two general areas: the North and West slopes and the ephemeral slope drainages. Twenty-five samples will be collected from the North and West slope areas and these samples will extend beyond the boundary of the known contamination (Table 4.2-1). The known areas of contamination will not be resampled because they are known to contain PCB concentrations that exceed the cleanup criteria of <1 ppm (Section 2.3). The existing data will be used for the final characterization of the site with the supplementary sampling results. Twenty-one samples will be collected from the ephemeral slope drainages and these samples will extend beyond the boundary of the drainages (Table 4.2-1). The soil in the drainages will not be resampled because results from the previous RFI sampling indicated that the drainages contain PCB concentrations exceeding the clean-up criteria of <1 ppm. (Section 2.3). The existing data will be used with the supplementary sampling results for the final characterization of the site. Proposed sample locations are presented in Figure 4.2-1.

Sample location points will be set up in the field before (or during) collecting the samples. Each point will be marked and given a unique sample location number. The points will be surveyed using a Trimble™ global positioning system (GPS) Total Station.

Grab samples will be collected from each location. The samples will be collected from soil at 0 - 0.5 ft depths (or tuff interface if shallower) using LANL-ER-SOP-6.09, Rev. 0, "Spade and Scoop Method for Collection of Soil Samples," and LANL-ER-SOP-6.10, Rev. 1., "Hand Auger and Thin-Wall Tube Sampler." If field screening indicates that PCB concentrations are greater than 1 ppm, soil or tuff will be further field screened at 1-ft intervals until concentrations are below 1 ppm or until the decision points are met, as set forth in Section 4.3.3. This approach will provide information on the vertical extent of contamination and a vertical stopping point for excavation. Samples taken in tuff will be collected using the backhoe bucket (or equivalent), a manually operated drill, or by chiseling pieces of tuff. The soil or tuff will be described and logged in on the sample collection log forms (LANL-ER-SOP-01.04, Rev. 3., "Sample Control and Field Documentation"). The samples will be brought to the field chemistry trailer to be screened for PCBs using an immunoassay field-screening test kit (EPA SW-846 Method 4020). The chosen test kit will be sensitive to less than 1 ppm total PCBs. This sensitivity is sufficient to meet the performance-required objectives and cleanup levels.

4.2.2 Laboratory Sampling

Ten samples (20 percent of the field-screened samples) will be submitted to an off-site laboratory to be analyzed as verification samples and to determine a correlation between the field results and the fixed-laboratory results (Table 4.2-2). The frequency of sampling and laboratory split analyses is in accordance with EPA sampling requirements (40 CFR 761.130, July 1998), LANL's Screening Level Ecological Risk Assessment Methods (LANL 1999, 63303) and standard operating procedures (SOPs), and NMED's Risk-Based Decision Tree Description (NMED 1998, 57761). The fixed-laboratory verification samples will be selected from field-screening samples containing low and high concentrations of PCBs. The correlation between the field and fixed-laboratory methods will provide information that will be used during the confirmatory sampling. At the fixed laboratory, the verification samples will be analyzed for PCBs using EPA SW-846 Method 8082. Note that PCBs are the only contaminants detected above levels of concern based on the 1994 RFI sampling and EC verification sampling results. The samples will be submitted for quick turnaround results (5 days), and the data will be used to help determine the required extent of removal during the cleanup activities.

TABLE 4.2-1
PROPOSED SUPPLEMENTARY SAMPLE LOCATIONS FOR PCB IMMUNOASSAY FIELD SCREENING

Location ID	Sample ID	Location	Location ID	Sample ID	Location
03-14233	RE03-99-2041	N & W slope*	03-14256	RE03-99-2064	N & W slope
03-14234	RE03-99-2042	N & W slope	03-14257	RE03-99-2065	N & W slope
03-14235	RE03-99-2043	N & W slope	03-14258	RE03-99-2066	Drainage
03-14236	RE03-99-2044	N & W slope	03-14259	RE03-99-2067	Drainage
03-14237	RE03-99-2045	N & W slope	03-14260	RE03-99-2068	Drainage
03-14238	RE03-99-2046	N & W slope	03-14261	RE03-99-2069	Drainage
03-14239	RE03-99-2047	N & W slope	03-14262	RE03-99-2070	Drainage
03-14240	RE03-99-2048	N & W slope	03-14263	RE03-99-2071	Drainage
03-14241	RE03-99-2049	N & W slope	03-14264	RE03-99-2072	Drainage
03-14242	RE03-99-2050	N & W slope	03-14266	RE03-99-2074	Drainage
03-14243	RE03-99-2051	N & W slope	03-14267	RE03-99-2075	Drainage
03-14244	RE03-99-2052	N & W slope	03-14268	RE03-99-2076	Drainage
03-14245	RE03-99-2053	N & W slope	03-14269	RE03-99-2077	Drainage
03-14246	RE03-99-2054	N & W slope	03-14270	RE03-99-2078	Drainage
03-14247	RE03-99-2055	N & W slope	03-14271	RE03-99-2079	Drainage
03-14248	RE03-99-2056	N & W slope	03-14272	RE03-99-2080	Drainage
03-14249	RE03-99-2057	N & W slope	03-14273	RE03-99-2081	Drainage
03-14250	RE03-99-2058	N & W slope	03-14274	RE03-99-2082	Drainage
03-14251	RE03-99-2059	N & W slope	03-14275	RE03-99-2083	Drainage
03-14252	RE03-99-2060	N & W slope	03-14276	RE03-99-2084	Drainage
03-14253	RE03-99-2061	N & W slope	03-14277	RE03-99-2085	Drainage
03-14254	RE03-99-2062	N & W slope	03-14278	RE03-99-2086	Drainage
03-14255	RE03-99-2063	N & W slope	03-14279	RE03-99-2087	Drainage

*N & W Slope = The North and West slopes

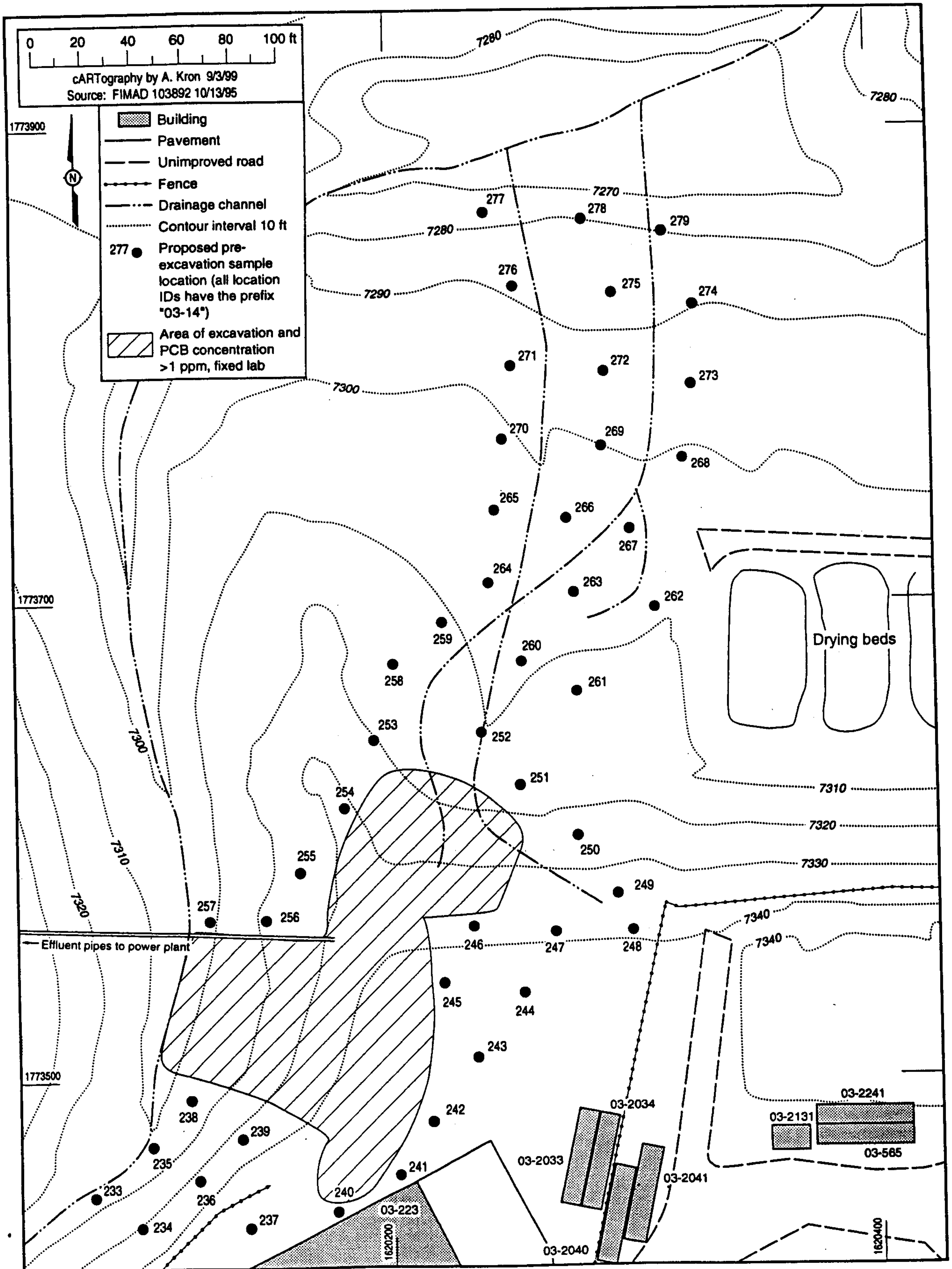


Figure 4.2-1. Proposed pre-excavation sample locations for PRS 03-056(c).

TABLE 4.2-2
PROPOSED SUPPLEMENTARY SAMPLE LOCATIONS FOR FIXED-LABORATORY ANALYSES

Sample ID	Location ID	Location	Analyses
RE03-99-2012	Based on field-screening results	North and West slope grid	PCB
RE03-99-2013	Based on field-screening results	North and West slope grid	PCB
RE03-99-2014	Based on field-screening results	North and West slope grid	PCB
RE03-99-2015	Based on field-screening results	North and West slope grid	PCB
RE03-99-2016	Based on field-screening results	North and West slope grid	PCB
RE03-99-2017	Based on field-screening results	Drainage Grid	PCB
RE03-99-2018	Based on field-screening results	Drainage Grid	PCB
RE03-99-2019	Based on field-screening results	Drainage Grid	PCB
RE03-99-2020	Based on field-screening results	Drainage Grid	PCB
RE03-99-2021	Based on field-screening results	Drainage Grid	PCB

4.3 Cleanup Activities

4.3.1 Mobilization and Preparation

Before conducting the cleanup activities, the site will be prepared and secured. A temporary construction fence or barricade will be installed at the top of the West and North slopes to secure the site from unauthorized access. Fencing will be conducted in accordance with facility management and health and safety requirements. Barricades will also be installed around planned waste storage, equipment decontamination areas, and other work zones, including the downslope perimeters of the excavation areas and contamination reduction zones (CRZ). The entire perimeter of the site will be marked with signs indicating that the site is a construction area and that unauthorized access is prohibited. During working hours, the construction supervisor will be responsible for security at the site and will keep track of site access; workers will sign in and out daily.

Within the overall perimeter of the construction site, three control zones will be established: exclusion zone (EZ), CRZ, and support zone (SZ) (Figure 4.3-1).

The EZ will encompass all areas where soil and tuff removal and waste staging will take place. Access to the EZ will be restricted to workers and other personnel with the required training.

Entrances and exits will be provided through access control points where supplies, rest areas, and initial decontamination measures will be established. To minimize the potential for cross-contamination, separate access points may be established for personnel and equipment. The CRZ will act as a buffer between the contaminated areas and the clean areas at the site (Figure 4.3-1). The CRZ reduces the potential for clean areas to be contaminated or affected by worker activities in the EZ. Decontamination of personnel and equipment will be performed in the "contamination reduction corridor" within the CRZ; separate corridors may be established for the West Slope, the North Slope, and drainage areas within PRS 03-056(c). The CRZs will also accommodate a temporary rest area.

Support Zones will be established outside of the EZ and the CRZs. They will be considered clean (Figure 4.3-1). The SZ will contain administrative and technical support personnel, a clean equipment staging area, a supply trailer, a water storage tank, non-contaminated heavy equipment and vehicle parking areas, protective equipment supply area, sampling equipment, fire extinguishers, spill control supplies, first aid equipment, tools, and a sample preparation area. Strict use of control zones will prevent the spread of contamination into the SZ.

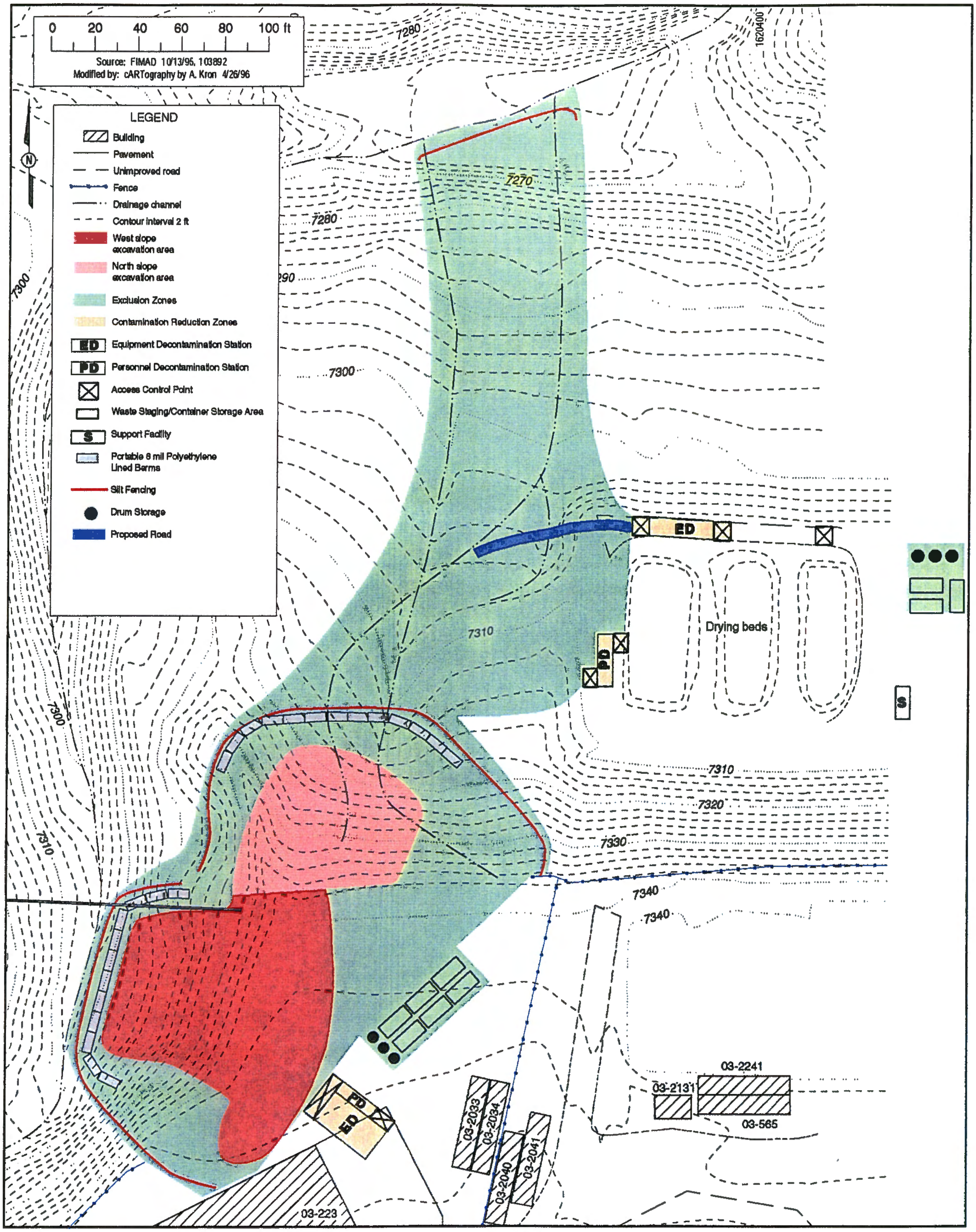


Figure 4.3-1. Proposed site logistics plan for the VCA at PRS 03-056(c)

4.3.2 Temporary Erosion Control Measures

LANL will work with ESH (Environmental Safety and Health) -18 personnel to determine the most appropriate BMPs for the site. To the extent practical, LANL will protect the existing matting on the slopes placed during the previous EC by disturbing it only when necessary and only in areas where necessary. LANL will use existing erosion control structures as much as feasible to ensure that soil and debris do not get released into the drainages during VCA activities.

4.3.3 Removal Activities

Based on previous field and laboratory analyses, the excavation approach will focus on three areas:

1. West Slope
2. North Slope
3. Ephemeral drainage channels north of the North Slope

Each area requires a distinctly different remediation approach as described below. Soil or tuff that is determined, either through field screening or based on previous results, to contain more than 50 ppm PCBs will be handled and stored separately from the rest of the soil and tuff. These volumes will be managed as TSCA PCB remediation waste per section 761.61 (40 CFR 750-761, July 1998).

All excavation activities will comply with ESH-17 air quality requirements.

There are two principal decision points associated with this VCA, one concerning reaching the cleanup level for the site, and the other concerning waste volume. Currently, the cleanup level for the site is <1 ppm PCBs and the estimated volume of material that is contaminated with 1 ppm or greater PCBs is 900 yd^3. These stopping rules are outlined below:

1. VCA excavation activities will stop if field screening indicates that the <1 ppm cleanup goal has been accomplished before excavating the entire 900 yd^3 of material. Samples will be collected for fixed laboratory analysis for verification purposes.

2. Samples will be collected before and as excavation proceeds to better define areas of contamination and refine volume estimates. If the refined volume estimates significantly increase from that originally expected (900 yd^3), a completion strategy will be developed based on the following criteria:

    - Prioritization of the removal of material in areas of higher concentration
    - Characterizing the extent of soil and tuff containing greater than 1 ppm PCBs and possibly doing a risk assessment to calculate remaining residual risk
    - Estimating the volume of material remaining on site
    - Timely communication with appropriate personnel

4.3.3.1 Excavation of the West Slope Area

The West Slope is the largest and steepest of the three areas of contamination. Along this steep slope, a track-mounted excavator (or trackhoe or equivalent) and soil vacuuming techniques will be used during remediation. The excavator is able to remove rock as well as soil. The vacuum truck will be used as a secondary technique.

A trackhoe with an extended reach (e.g., JD-790, or equivalent excavator) will initially be staged at the top of the slope and will remove soil from the top of the slope downward, as directed by excavation guidance sampling. Given the extended reach of the selected excavation equipment, the steepest upper part of the

West Slope can be remediated while the excavator is working from flat ground at the top of the slope, thereby promoting safety. While the excavator is staged at the top of the slope, soil can be loaded directly from the excavator bucket into piles within the EZ or in dump trucks. The bucket will be filled to a level from which there will be no spilling of soil during transport.

Once the upper portion of the West Slope has been remediated, the excavator will be moved to mid-slope to accomplish remediation of the lower portion. The lower portion of the slope has a sufficiently flat grade to allow for safe deployment of the excavator; however, work practices will also be employed to further enhance safety by ensuring that the excavator is always operated with the tracks pointing downslope (the most stable position). A mid-slope bench may be required in order to maintain a workable platform for the excavator to operate from. If this becomes necessary, a bench will be constructed into the tuff and maintained in accordance with Occupational Safety and Health Administration (OSHA) and LANL safety requirements.

Precautions will be taken to prevent cross-contamination that could result from the excavator traversing between contaminated and clean soil areas. The excavator will be staged on clean ground and will progress downslope to clean areas previously excavated. A logical progression of removal will be employed such that soil is removed from the top of the slope downward. The excavator will work from clean ground at all times. This method will continue until the entire West Slope has been cleaned.

While the excavator is working the lower portion of the West Slope, a 4-yd^3 track loader (CAT 973 or equivalent) will be employed to move soil to the temporary piles or directly into dump trucks at the top of the slope within the PRS boundary. Use of a track-mounted loader is the safest means of moving soil up the slope. The track loader will operate behind the excavator so that it will only be moved across clean areas that have been previously excavated. The loader will transfer material to and from the West Slope area and staging area along a predetermined corridor (to prevent cross-contamination).

Certain areas of contamination within the West Slope may be inaccessible to the excavator bucket (e.g., areas surrounding tree trunks or large rocks). For these areas, a vacuum system, the SpoilVac 500 or equivalent, will be used to remove contaminated soil and rock. The vacuum system is mounted on a truck and feeds directly into a standard 55-gal. drum. Up to 50 ft of flexible suction hose is attached to the vacuum head, allowing a range of movement around the drum. Air emissions from the vacuum are controlled by attaching a high-efficiency particulate air (HEPA) filter bag to the exhaust port of the vacuum head. Once the drum is filled, the vacuum head is removed and attached to a new drum.

4.3.3.2 Excavation of the North Slope Area

Excavation of the North Slope will be accomplished using a backhoe (CAT 426c or equivalent) and a 6-yd^3 dump truck or equivalent. Access to the North Slope will be accomplished by extending the dirt road located north of the drying beds southwest to the perimeter of the contaminated area; it will not go through the contaminated area. Precaution will be taken to minimize damage to standing trees. Once the road is extended, the backhoe (or equivalent) and dump truck (or equivalent) can easily access the entire contaminated zone from flat portions of the area. The backhoe will excavate soil and dump directly into the dump truck, which will transport the soil to the waste staging area, or the backhoe (or equivalent) will dump directly into the waste containers. Excavation will progress from the access road to the southwest so that the backhoe will always be working on clean areas that were previously excavated.

Certain areas of contamination within the North Slope may be inaccessible to the backhoe bucket (e.g., areas surrounding tree trunks or large rocks). The vacuum system will be used to remove contaminated soil and rock from these areas, and this soil and debris will be transferred into drums or rolloffs. Drums of vacuumed soil and rock will be moved to the waste staging area by backhoe (or equivalent) or an all-terrain vehicle (ATV) with a small trailer attachment with the appropriate load capacity.

4.3.3.3 Excavation of the Ephemeral Drainage Channels

The vacuum system will be used to remediate the drainage channels north of the North Slope area. It can effectively remove small, localized pockets of contaminated soil. Vacuuming will proceed systematically from south to north, as directed by excavation guidance sampling, in order to prevent cross-contamination. Drums will be moved to the waste staging area using a backhoe (or equivalent) or an all-terrain vehicle (ATV) with a small trailer attachment with the appropriate load capacity.

4.4 Decontamination of Equipment and Personnel

Temporary decontamination stations will be set up in the CRZ corridors (as shown in Figure 4.3-1). Personnel decontamination stations will be located at the exit from the exclusion area and may contain plastic sheeting, plastic-lined trash cans, wash tubs, and brushes, or equivalent. A 55-gal. drum or equivalent will be located next to the personnel decontamination stations for collection of wash water. Water will be supplied via a small water-storage tank or container that will be located in the SZ. A detergent such as Liqui-Nox™ will be used for wet decontamination.

Decontamination will be conducted for equipment leaving the CRZ and EZ (e.g., during movement of equipment from the West Slope to the North Slope) and on equipment being released from the site. The decontamination will take place on a wash pad constructed so that cleaning solutions and wash water can be recycled and collected for proper disposal.

To reduce the volume of decontaminated water that is generated, dry decontamination will be used as a preliminary measure. All parts of the heavy equipment, including the undercarriage, wheels and tracts, chassis, and cab, will be thoroughly cleaned initially by dry decontamination and then by swabbing with a minimal amount of water and detergent. Air filters will be removed and replaced before the equipment leaves the site. Long-handled brushes will be used to effectively remove contaminated soil from heavy equipment and from the vacuum system.

Daily decontamination of the heavy equipment would be impractical. Both the heavy equipment and the drum vacuum system will remain in the EZ until use is complete. Partial decontamination may occur on a daily basis to remove mud buildup. Final decontamination of all heavy equipment will be conducted at the end of the excavation effort.

4.5 Site Restoration

Depending on the post-excavation conditions, the best restoration approach will be devised. If the post-excavation slope is composed of exposed bedrock, the final restored configuration may only include run-on/run-off controls to address storm water concerns. The site restoration design will be addressed following excavation when the physical aspects of the final slope are known.

The LANL ER storm water pollution prevention plan (SWPPP) will be updated at the start of VCA activities (by submitting site-specific information on the LANL SWPPP update form). LANL will consult with ESH-18 and facility management regarding the SWPPP.

5.0 CONFIRMATORY SAMPLING

Confirmatory sampling will be conducted following the removal activities and before site restoration. Sampling will be performed to verify that:

- the extent of PCB contamination associated with the PRS has been vertically and laterally bounded
- soil remaining at the site does not contain concentrations of PCBs exceeding 1 ppm
- there is an acceptable human health risk to an industrial worker and an acceptable ecological risk

The data collected during the supplementary sampling and the extent of the excavation will be used to set the boundaries of the confirmation sampling. The proposed sampling strategy considers the verification sampling strategy in EPA's latest guidance contained in 40 CFR 761 (Subpart 0), with modification for site-specific characteristics and existing site knowledge at this PRS. Rather than propose a Cartesian-grid sampling approach as recommended by EPA in 40 CFR 761 (Subpart 0), LANL proposes sampling on hexagonal grids that have been centered on the cleanup areas and that extend beyond the boundaries of the PRS. The hexagonal grid combined with previous sample data will provide sufficient spatial coverage of the area under investigation without unnecessary duplication. Two hexagonal grids will be set up: one to cover the North and West slopes, and the other to cover the ephemeral slope drainages. For each grid, equilateral triangles will be set up using up to 37 points. The grid sampling layout is presented in Figure 5.0-1. The points will be set up in the field before or during sample collection. Each point within the grids will be marked, and unique sample location numbers will be designated for each point. Table 5.0-1 presents proposed confirmation field-screening sample information. The points will be surveyed using a Trimble™ GPS Total Station. Field screening will be used to direct the laboratory sampling. Details are discussed below.

5.1 Field Screening

Grab samples will be taken from each grid location to determine whether the cleanup criterion has been met. If field screening indicates PCB concentrations are greater than 1 ppm, excavation will continue until either concentrations are less than 1 ppm or until a decision point has been met, as set forth in Section 4.3.3. Samples will be collected from 0–0.5 ft depths using LANL-ER-SOP-6.09, Rev. 0, "Spade and Scoop Method for Collection of Soil Samples", and LANL-ER-SOP-6.10, Rev. 1, "Hand Auger and Thin-Wall Tube Sampler." If the sample is within tuff, it will be collected using the backhoe bucket (or equivalent), a manually operated drill, or by chiseling pieces of tuff. The soil or tuff will be described and logged into the sample collection log forms (LANL-ER-SOP-01.04, "Sample Control and Field Documentation," Rev. 3). The samples will be brought to the field chemistry trailer to be screened for PCBs using the immunoassay field-screening kit (EPA SW-846 Method 4020). The immunoassay test kit will be chosen to have a working accuracy to 0.5 ppm for PCBs. This accuracy is sufficient to meet the performance-required objectives and cleanup level.

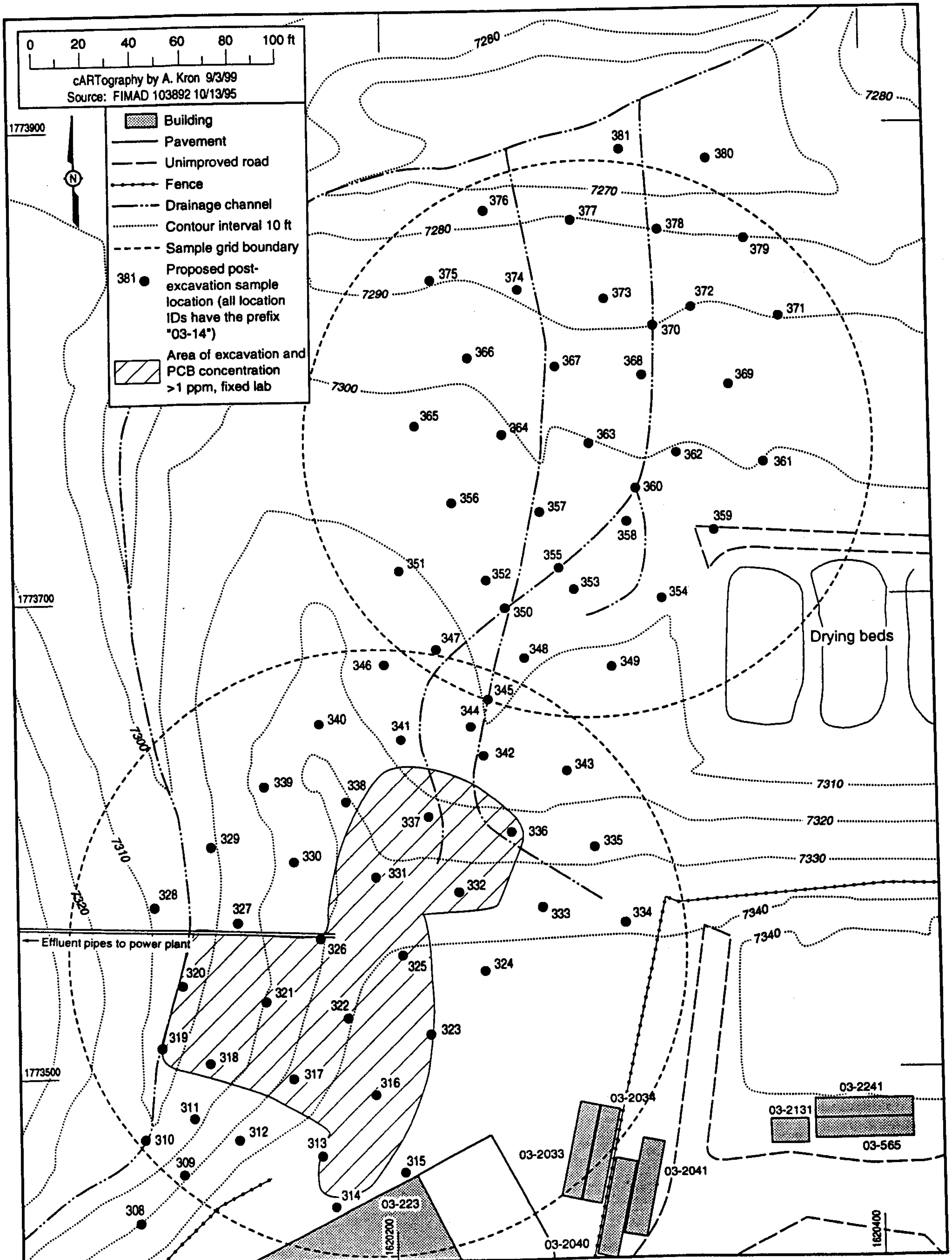


Figure 5.0-1. Proposed post-excavation sample locations for PRS 03-056(c).

TABLE 5.0-1
PROPOSED CONFIRMATION SAMPLE LOCATIONS FOR IMMUNOASSAY FIELD SCREENING

Location ID	Sample ID	Location
03-14308	RE03-99-2116	N & W slope
03-14309	RE03-99-2117	N & W slope
03-14310	RE03-99-2118	N & W slope
03-14311	RE03-99-2119	N & W slope
03-14312	RE03-99-2120	N & W slope
03-14313	RE03-99-2121	N & W slope
03-14314	RE03-99-2122	N & W slope
03-14315	RE03-99-2123	N & W slope
03-14316	RE03-99-2124	N & W slope
03-14317	RE03-99-2125	N & W slope
03-14318	RE03-99-2126	N & W slope
03-14319	RE03-99-2127	N & W slope
03-14320	RE03-99-2128	N & W slope
03-14321	RE03-99-2129	N & W slope
03-14322	RE03-99-2130	N & W slope
03-14323	RE03-99-2131	N & W slope
03-14324	RE03-99-2132	N & W slope
03-14325	RE03-99-2133	N & W slope
03-14326	RE03-99-2134	N & W slope
03-14327	RE03-99-2135	N & W slope
03-14328	RE03-99-2136	N & W slope
03-14329	RE03-99-2137	N & W slope
03-14330	RE03-99-2138	N & W slope
03-14331	RE03-99-2139	N & W slope
03-14332	RE03-99-2140	N & W slope
03-14333	RE03-99-2141	N & W slope
03-14334	RE03-99-2142	N & W slope
03-14335	RE03-99-2143	N & W slope
03-14336	RE03-99-2144	N & W slope
03-14337	RE03-99-2145	N & W slope
03-14338	RE03-99-2146	N & W slope
03-14339	RE03-99-2147	N & W slope
03-14340	RE03-99-2148	N & W slope
03-14341	RE03-99-2149	N & W slope
03-14342	RE03-99-2150	N & W slope
03-14343	RE03-99-2151	N & W slope
03-14344	RE03-99-2152	N & W slope

* N & W slope = The North and West slopes

Location ID	Sample ID	Location
03-14345	RE03-99-2153	Drainage
03-14346	RE03-99-2154	Drainage
03-14347	RE03-99-2155	Drainage
03-14348	RE03-99-2156	Drainage
03-14349	RE03-99-2157	Drainage
03-14350	RE03-99-2158	Drainage
03-14351	RE03-99-2159	Drainage
03-14352	RE03-99-2160	Drainage
03-14353	RE03-99-2161	Drainage
03-14354	RE03-99-2162	Drainage
03-14355	RE03-99-2163	Drainage
03-14356	RE03-99-2164	Drainage
03-14357	RE03-99-2165	Drainage
03-14358	RE03-99-2166	Drainage
03-14359	RE03-99-2167	Drainage
03-14360	RE03-99-2168	Drainage
03-14361	RE03-99-2169	Drainage
03-14362	RE03-99-2170	Drainage
03-14363	RE03-99-2171	Drainage
03-14364	RE03-99-2172	Drainage
03-14365	RE03-99-2173	Drainage
03-14366	RE03-99-2174	Drainage
03-14367	RE03-99-2175	Drainage
03-14368	RE03-99-2176	Drainage
03-14369	RE03-99-2177	Drainage
03-14370	RE03-99-2178	Drainage
03-14371	RE03-99-2179	Drainage
03-14372	RE03-99-2180	Drainage
03-14373	RE03-99-2181	Drainage
03-14374	RE03-99-2182	Drainage
03-14375	RE03-99-2183	Drainage
03-14376	RE03-99-2184	Drainage
03-14377	RE03-99-2185	Drainage
03-14378	RE03-99-2186	Drainage
03-14379	RE03-99-2187	Drainage
03-14380	RE03-99-2188	Drainage
03-14381	RE03-99-2189	Drainage

5.2 Laboratory Sampling

Sixteen samples (20 percent of the field-screened samples) will be submitted for off-site laboratory analyses to ensure that cleanup of PCBs is complete (Table 5.0-2). The frequency of sampling and laboratory split analyses is in accordance with EPA verification sampling requirements (40 CFR 761.130), LANL's Screening Level Ecological Risk Assessment Methods (LANL 1999, 63303) and SOPs, and NMED's Risk-Based Decision Tree Description (NMED 1998, 57761). Locations of verification samples will be selected from the field-screening samples containing elevated concentrations of PCBs. This conservative approach will ensure that any potential remaining contamination will be detected with laboratory analysis.

After the verification sample locations are determined (based on field screening results), the field team will remobilize to collect the 16 samples (two samples from each of 8 determined locations). Verification samples will be collected at a surface depth (just below the excavation) and bounding samples will be collected from approximately 2 ft below the excavation. All of the verification and bounding samples will be analyzed for PCBs at the fixed laboratory using EPA SW-846 Method 8082. Note that PCBs are the only contaminants detected above levels of concern based on the 1994 RFI sampling and EC verification sampling results.

In order to conduct a complete assessment of the site after corrective action, a total of 12 samples taken on a random basis from 6 locations (75% of the verification samples) will be selected from the 16 samples and submitted to the fixed laboratory for additional analyses of metals and PCE. PCE will be analyzed using EPA SW846 Method 8260. Metals will be analyzed using EPA SW846 Methods 6010/6020/7421. This should provide enough data to conduct screening and risk assessments to confirm that ecological and human health risks are at acceptable levels. These samples may be submitted for quick turnaround results (5 days), and the data will be used to determine that cleanup activities are complete. The analytical results in combination with previous sampling results will be evaluated to determine if data gaps exist requiring additional confirmation sampling. Only after the confirmation sampling results have been obtained and data analysis and assessment is completed will the site be restored (as discussed in Section 4.4).

TABLE 5.0-2
PROPOSED VERIFICATION SAMPLE LOCATIONS AND ANALYSES*

Sample ID	Location ID	Location	Analyses
RE03-99-2022	Based on field-screening results	North and West slope grid	PCB
RE03-99-2023	Based on field-screening results	North and West slope grid	PCB
RE03-99-2024	Based on field-screening results	North and West slope grid	PCB
RE03-99-2025	Based on field-screening results	North and West slope grid	PCB
RE03-99-2026	Based on field-screening results	North and West slope grid	PCB
RE03-99-2027	Based on field-screening results	North and West slope grid	PCB
RE03-99-2028	Based on field-screening results	North and West slope grid	PCB
RE03-99-2029	Based on field-screening results	North and West slope grid	PCB
RE03-99-2030	Based on field-screening results	North and West slope grid	PCB
RE03-99-2031	Based on field-screening results	Drainage grid	PCB
RE03-99-2032	Based on field-screening results	Drainage grid	PCB
RE03-99-2033	Based on field-screening results	Drainage grid	PCB
RE03-99-2034	Based on field-screening results	Drainage grid	PCB
RE03-99-2035	Based on field-screening results	Drainage grid	PCB
RE03-99-2036	Based on field-screening results	Drainage grid	PCB
RE03-99-2037	Based on field-screening results	Drainage grid	PCB

* The samples submitted for metals and VOCs will be determined based on field screening results

6.0 WASTE MANAGEMENT

6.1 Estimated Types and Volumes of Wastes

PCB remediation waste will be managed in accordance with the guidelines contained in 40 CFR Part 761.61 of the regulations pertaining to PCB-contaminated soils and waste.

Table 6.1-1 summarizes the wastes that could be generated during the VCA cleanup at PRS 03-056(c).

TABLE 6.1-1
ANTICIPATED WASTE TYPE AND VOLUME FOR VCA AT PRS 03-056(c)

Item	Waste Type	Anticipated Volume
Soil and tuff	PCB-contaminated remediation waste (< 50 ppm PCBs)	900 yd^3*
Soil and tuff	PCB-contaminated remediation waste (> 50 ppm PCBs)	4 yd^3
Personnel Protective Equipment (PPE)/sampling waste	Solid waste (< 50 ppm PCBs)	<1 yd^3
Decontamination liquids	PCB-containing water (< 50 ppm)	200 gal.

* Based on previous EC volumetric estimates

A Waste Characterization Strategy Form (WCSF) has been prepared and submitted to ESH-19 and EM-FWO/SWO (Facility and Waste Operations Division/Solid Waste Operations) for review and approval. The WCSF describes the requirements and uncertainties associated with each waste type that will be generated during this VCA.

6.2 Method of Management and Disposal

Cleanup activities at PRS 03-056(c) involve removing PCB remediation waste consisting of soil containing 1 ppm or greater PCBs. The soil will be sampled for PCBs and any other analytes using the methodology described in Section 5.2 as required by the disposal facility that will accept these wastes.

The removed soil will be stored on-site until all analyses have been evaluated to determine its waste classification. The soil will then be transported to an approved waste disposal facility. Nonrecyclable (PPE, gloves, plastic sheets, etc.) and sampling equipment (scoops, jars, etc.) will be stored on-site in 55-gal. drums until disposal at an approved waste facility. PPE/sampling equipment will not be directly sampled; however, characterization will be based on site-characterization data (soil and/or tuff analyte results).

Based on the low concentration level detected after the EC (less than 50 ppm total PCBs), the majority of the soil at this site is considered PCB-contaminated remediation waste, and can be disposed of in a LANL-approved state-permitted landfill following regulatory requirements (40 CFR 750-761, July 1998).

Based on existing analytical information, approximately 4 yd^3 of PCB remediation waste (> 50 ppm total PCBs) exists at the site. The waste will be segregated, stored and transported to a LANL-approved TSCA waste disposal facility.

Wastes generated from the immunoassay sampling kits will be temporarily stored in a container in a Satellite Accumulation Area within or near the chemistry laboratory trailer until removed to a Less-Than-90-Day Storage Area and/or to a Treatment, Storage, and Disposal (TSD) facility.

PCB-containing decontamination water used during the remedial activities will be containerized and disposed of at a LANL approved waste disposal facility.

7.0 PROPOSED SCHEDULE AND UNCERTAINTIES

The estimated schedule required to complete the VCA at PRS 03-056(c) is presented below.

Task Name	Task Duration (days)	Total Elapsed Time from Project Start (days)
Readiness Review	30	30
Mobilization	30	60
Pre-Excavation Sampling	30	90
Excavation Waste Management	60	150
Post-Excavation Sampling	15	165
Site Restoration	21	186
Prepare VCA Report	60	246

8.0 REFERENCES

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ATSDR (Agency for Toxic Substances and Disease Registry), 1995. "Toxicological Profile for Polychlorinated Biphenyls Draft for Public Comment," ATSDR and Research Triangle Institute profile at www.atsdr.cdc.gov, Division of Toxicology/Toxicology Information Branch, Atlanta, Georgia. (ATSDR 1995, 63537)

EPA (US Environmental Protection Agency), August 1985. "Verification of PCB Spill Cleanup by Sampling and Analysis," Environmental Protection Agency report EPA-560/5-85-026, Washington, D.C. (EPA 1985, 08026.1)

LANL (Los Alamos National Laboratory), April 1999. "Screening Level Ecological Risk Assessment Methods," Los Alamos National Laboratory report LA-UR-99-1405, Los Alamos, New Mexico. (LANL 1999, 63303)

LANL (Los Alamos National Laboratory), November 1998. "Installation Work Plan for Environmental Restoration Project," Revision 7, Los Alamos National Laboratory report LA-UR-98-4652, Los Alamos, New Mexico. (LANL 1998, 62060)

LANL (Los Alamos National Laboratory), April 1996. "Draft FSR for SWMU 03-056(c) Expedited Cleanup, R0." Los Alamos National Laboratory, Los Alamos, New Mexico (LANL 1996, ER ID 55746)

LANL (Los Alamos National Laboratory), 1995a. "Site Development Plan - Annual Update 1995," Los Alamos National Laboratory report LALP-95-113, Los Alamos, New Mexico. (LANL 1995, 57224)

LANL (Los Alamos National Laboratory), 1995b. "Los Alamos National Laboratory Environmental Restoration Project Expedited Cleanup Plan for Solid Waste Management Unit 03-056(c)," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1995, 52951.40)

LANL (Los Alamos National Laboratory), July 1993. "RFI Work Plan for Operable Unit 1114," Los Alamos National Laboratory report LA-UR-93-1000, Los Alamos, New Mexico. (LANL 1993, 20947)

NMED (New Mexico Environment Department), March 1998. "Risk-Based Decision Tree Description," in *the New Mexico Environment Department Hazardous and Radioactive Materials Bureau RCRA Permits Management Program (RPMP) Document Requirement Guide*. (NMED 1998, 57761)

APPENDIX A

ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS

ATSDR	Agency for Toxic Substances and Disease Registry
ATV	all-terrain vehicle
BCP	Baseline Change Proposal
BMP	best management practice
CEM	conceptual exposure model
CFR	Code of Federal Regulations
CRZ	contamination reduction zone
DOE	US Department of Energy
EC	expedited cleanup
EM	Environmental Management (division)
EMS	erosion matrix score
EM-FWO/SWO	Environmental Management – Facility Waste Operations/Solid Waste Operations
EPA	US Environmental Protection Agency
ER	environmental restoration
ESH	Environmental Safety and Health (division)
EZ	exclusion zone
GPS	global positioning system
HEPA	high efficiency particulate air (filter)
HRMB	Hazardous and Radioactive Materials Bureau
HSWA	Hazard and Solid Waste Amendments of 1984
IWP	Installation Work Plan
JCI	Johnson Controls Incorporated
LAAO	Los Alamos Area Office
LANL	Los Alamos National Laboratory
NFA	no further action
NMED	New Mexico Environment Department
NOD	notice of deficiency
OSHA	Occupational Safety and Health Administration

PCB	polychlorinated biphenyl
PCE	perchloroethene, tetrachloroethene
PPE	personal protective equipment
ppm	part per million
PRS	potential release site
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RPMP	RCRA Permit Management Program
SAL	screening action level
SOP	standard operating procedure
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWPPP	Storm Water Pollution Prevention Plan
SWQB	Surface Water Quality Bureau
SZ	support zone
TA	technical area
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
VCA	voluntary corrective action
VOC	volatile organic compound
WCSF	Waste Characterization Strategy Form
yd^3	cubic yard

APPENDIX B

VCA CHECKLIST

Accelerated Corrective Action (ACA)
Checklist and Field Work Authorization Form
PRS No. 03-056(c) HSWA

Yes	No	
√		Fact sheet describing planned activities is complete and attached to checklist
√		COPC(s) for HH, ECO, or other requirements are known or will be determined during accelerated site characterization
√		Nature and extent of contamination is defined or accelerated site characterization is planned as part of this action to define nature and extent and guide cleanup.
√		Cleanup levels/PRGs are appropriate.
√		Remedy is obvious
√		Time for removal is less than 6 months.
√		Remedy is final.
√		Land use assumptions are straight forward.
√		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 ACA.
	√	Briefing for NMED is required
Explain criteria not checked above:		

Upon reviewing the Accelerated Corrective Action Fact Sheet and the criteria checklist above, the appropriate Accelerated Corrective Action approach for the PRS(s) is:

VCA	√
VCM	

Signature of UC-LANL, DOE-LAAO, and NMED-HRMB Representative	Date
UC	
DOE	
NMED	

The undersigned have reviewed the final plan and believe that it fully satisfies the appropriate Accelerated Corrective Action Approach.

Signature of UC-LANL and DOE-LAAO Representative	Date
UC	
DOE	

Action	Date	Correspondence ID
VCA/VCM plan submitted to NMED		
NOD or RSI Received from NMED		
LANL Response to NOD or RSI		
NMED Approval to VCA/VCM Plan		

After reviewing VCA/VCM Plan, for the site(s) listed above, and believing that the ACA process and VCA/VCM criteria have been met, I authorize the fieldwork to proceed.

DOE ER Program Manager ________________________ Date ___________

PRS 3-056(c) Voluntary Corrective Action Fact Sheet
Removal Of PCB Contaminated Soil
SRS: 36
Erosion Matrix Score: 52.6

Description And History

PRS 3-056(c) is a storage area located northeast of the JCI Utilities Shop (TA-3-223). This area was used by the Laboratory's electrical power line maintenance contractor from 1967 to present. Items stored throughout the yard include electrical cable, used and unused dielectric oils, PCB-containing transformers, capacitors, and oil filled-drums. Drums containing waste and product solvents were also stored at the site.

Transformers with less than 500 ppm PCB were drained into drums at this location, then transported to salvage. Solvents were used to clean electrical equipment. Solvent soaked rags were used to wipe down equipment, the residual solvent was placed in a drum. Once a few drums were full, they were removed from the site for disposal. A nonhazardous citrus-based solvent has been used at the site from 1990 to present. Waste solvent storage area was decommissioned in 1992.

Contaminants

Based on the results of the following sampling events conducted in 1992, 1994, and 1995, several contaminants of potential concern (COPCs) were identified.

In 1992 a slope stabilization project (from water/snow erosion) was initiated at Bld. TA-3-223. Reconnaissance sampling was performed at 5 locations prior to anticipated stabilization activities. PCB results from the reconnaissance sampling halted the stabilization activities. A Phase I RFI was performed in 1994, detection of contaminants (PCBs) greater than SALs lead to an expedited cleanup (EC) in 1995. Mercury, copper, and zinc were also detected at a concentration exceeding their background values (BVs). The list of detected organic chemicals included benzo(b)fluoranthene, tetrachloroethylene, methylene chloride, chrysene, fluoranthene, and pyrene. Because the inorganics and organics listed above (except for Aroclors-1242, -1254 and –1260) were at levels well below SALS, the contaminants that launched the EC were Aroclors-1242, -1254, and –1260.

TSCA guidance was used to determine the 10 ppm PCB cleanup level for the industrial site. A human health and ecological risk assessment was also performed using 10 ppm to back calculate an acceptable cleanup level, which confirmed the TSCA prescribed number to be adequately protective. One thousand cubic yards of PCB contaminated material was removed from the site. For the most part, the two acre site was cleaned up to a less than 10 ppm total PCBs clean up level. PCBs are the only contaminants expected to be remaining onsite based on samples collected during the 1995 EC.

Rationale

The site is located on a steep slope that leads to a Sandia Canyon tributary. The site is considered a watercourse, although only 10-15 ft of the western slope's toe is actually within the high water table. Because PCBs are bioaccumulators, the administrative authority has requested that this site be cleaned up to a level of less than 1 ppm total PCBs instead of the 10 ppm PCBs the site was cleaned to in 1995. Therefore, additional corrective action will be initiated at this site.

Voluntary Corrective Action

The corrective action at this site will involve the removal of PCB contaminated tuff, as well as channel sediment deposits. The estimated amount of material to be excavated is approximately 930 cubic yards. Details of the excavation have not been finalized, but it is currently believed that these activities will be completed using the combined efforts of heavy equipment and vacuum trucks. Continued disturbance to the surrounding environment is inevitable because the northern slope where the storm water channels drain is heavily forested. Excavation of tuff and sediments from the channels will require removal of some trees. To minimize environmental disturbance use of a vacuum truck will be considered, but hand digging would likely be cost prohibitive. Site restoration will be extensive and require installation of: rock gabions, new drainage grading and a drainage drop inlet, erosion control matting and seeding, new fencing, and a new asphalt storage/parking pad.

Anticipated Waste Types and Volumes

ITEM	WASTE TYPE	ANTICIPATED VOLUME
PCB contaminated soil and tuff material (Mostly 1 to 10 ppm PCB expected)	< 50 ppm PCB waste (with letter from EPA-TSCA for special dispensation)	930 cu yd
PCB contaminated decon water from heavy equipment	< 10 ppm PCB decon water	220 gals.
Sampling materials and PPE	Sanitary	2 cu yd

Estimated Cost

The remedial activities, including planning, cleanup, waste disposal, site restoration, and report preparation will range from $930K to $1.3 million depending on the special EPA-TSCA dispensation for waste disposal of PCBs as a <50 ppm PCB waste stream to a non-TSCA facility. Otherwise, if the waste stream is considered TSCA at the highest PCB value found at the site (greater than 500 ppm PCB) the waste stream will probably have to be shipped to Kettleman Hills, California as done in the 1995 EC, where disposal and transportation costs were very high.

Schedule

The field work portion of this VCA is expected to begin in April 1999 and take approximately 8 months to complete. The field work includes soil removal, verification sampling, and site restoration.

Reference List of Past Plans, Reports, NODs, RSI, etc.

- RFI Work Plan for Operable Unit 1114 (LA-UR-93-1000), Subsection 5.10.
- Los Alamos National Laboratory Environmental Restoration Project Expedited Cleanup Plan for SWMU 3-056(c).
- Field Summary Report for EC at PRS 3-056(c) by ERM/Golder, 1996.
- Status Report for Solid Waste Management Unit 3-056(c) and Proposal of Cleanup Level, December 7, 1995, EM/ER:95-704.
- Notice of Deficiency, Status Report for SWMU 3-056(c), Los Alamos National Laboratory (NM0890010515), March 13, 1996.
- Response to the Notice of Deficiency for Solid Waste Management Unit 3-056(c), Technical Area 3, Expedited Cleanup Status Report. May 2, 1996, EM/ER:96-253.

APPENDIX C

SOP 2.01

Los Alamos National Laboratory

Environment, Safety & Health Division
ESH-18 Water Quality & Hydrology Group

Surface Water Assessment Erosion Matrix for PRS 03-056(c)

CRITERIA EVALUATED	Value	Erosion/Sediment Transport Potential: Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43)					
On mesa top	1	Defined based on topographic setting			
Within bench of canyon	4				
Within the canyon floodplain but not watercourse	13				
Within bottom of canyon channel in watercourse	17				17.0
Estimated % ground and canopy cover	13	>75%	25-75%	<25%	13.0
Slope	13	0-10%	10-30%	>30%	6.5
Surface Water Factors-Run-off (46)					
Visible evidence of runoff discharging? (Yes/No)	5	If no, score of 0 for runoff section.			5.0
		If yes, score 5 and proceed with section.			
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	19.0
Has runoff caused visible erosion? (Yes/No)	22	Sheet	Rill	Gully	2.2
		If no, score as 0. If yes, calculate as appropriate.			
Surface Water Factors-Run-on (11)					
Structures adversely affecting run-on (Yes/No)	7*	If yes, score as 7. If no, score as 0.			7.0
Current operations adversely impacting (Yes/No)	4	If yes, score as 4. If no, score as 0.			0.0
Natural drainages onto site (Yes/No)	7*	If yes, score as 7. If no, score as 0.			0.0
**Select either structures or natural drainages.*					
MAX. POSSIBLE EROSION MATRIX SCORE:	**100**			**Total Score**	69.7**

REVISED PART B

** Indicates BMPs in place. Erosion potential without BMPs may be greater.

Report Printed 9/2/99 12:37:26 PM.

Los Alamos National Laboratory
SURFACE WATER
SITE ASSESSMENT

Revised Part B. Please discard previous.

SITE INFORMATION

1a) PRS Number 03-056(c) **1b) Structure Number** 3-223 **1c) FMU Number** ______

2. Date/Time (M/D/Y H:M am/pm) 9/16/97 11:00:00 AM

SITE SETTING (check all that apply)

3. ● **On mesa top (a).** ○ **In the canyon floor, but not in an established channel (c).**

○ **Within a bench of a canyon (b).** ● **Within established channel in the canyon floor (d).**

Explanation: Former transformer clean-out/storage area. PRS extends to the north and west from edge of canyon to just above watercourse in tributary of Sandia canyon.

4. Estimated ground and/or canopy cover at site: (deciduous leaves, pine needles, rocks, vegetation, trees, structures, asphalt, etc.)

(illustration) (a) (b) (c)

Estimated % of ground/canopy cover: ● 0% to 25% ○ 25% to 75 ● 75% to 100

Explanation: Site is exposed due to remediation effort. Mostly soils and rock which is currently covered with plastic.

5. Steepest slope at the area impacted:

(a) (b) (c)

○ Less than 10% ● 10% to 30% ○ 30% and greater

Explanation: Located on exposed northwest and north facing slope.

RUNOFF FACTORS

Y / N

✓ __ **6. Is there visible evidence of runoff discharging from site? If yes, answer a) - c) below:**

__ ✓ 6a) Is runoff channelized? If yes, describe ○ Man-made channel. ○ Natural channel.

Explanation: Sheet flow runoff from slope directly into tributary of Sandia Canyon. Northern site has natural channels created from runoff of adjacent parking area.

RUNOFF FACTORS, CONT'D

6b) Where does evidence of runoff terminate?

- • **Drainage or wetland (name)** Sandia Canyon
- **Within bench of canyon setting (name)**
- **Other (i.e., retention pond, meadow, mesa top)**

Explanation: Runoff terminates directly into tributary below site. There are additional sources of potential contaminants immediately upstream from the site (TA-3 Power Plant 3-22).

Y / N

✓ _ 6c) Has runoff caused visible erosion at the site? If yes, explain below • Sheet Rill Gully

Explanation: Visible erosion difficult to see due to plastic cover. Any current erosion processes have been impeded while remediation effort is ongoing.

RUN-ON FACTORS

Please rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)

✓ _ 7. Are structures (i.e., buildings, roof drains, parking lots, storm drains) creating run-on to the site?

Explanation: Parking lot above PRS.

_ ✓ 8. Are current operations (i.e., fire hydrants, NPDES outfalls) adversely impacting run-on to the site?

Explanation: No operational impact

_ ✓ 9. Are natural drainage patterns directing stormwater onto site?

Explanation: Run-on is diverted by asphalt berm and channel.

ASSESSMENT FINDING:

✓ _ **10. Based on the above criteria and the assessment of this site, does soil erosion potential exist? (REFER TO EROSION POTENTIAL MATRIX.)**

Veenis, Steve

11. Signature of Water Quality/Hydrology Representative

SN Initials of independent reviewer.

Check here when information is entered in database: ✓

This page is for ESH-18 notes, recommendations, and photos.

	Y / N		
12. a)		●	Is there visible trash/debris on the site?
b)		●	Is there visible trash/debris in a watercourse?

Description of existing BMPs:

Curlex geomat were placed over the entire slope in November 1997. Asphalt berm diverts storm water away from slope on top of site. Original BMPs installed 7/31/95.

Y	N	
●		Are BMPs being properly maintained? If no, describe in "Other Internal Notes."
●		Are BMPs effectively keeping sediment in place and reducing erosion potential?

OTHER INTERNAL NOTES:

The score had previously been recorded as (52.6) but was modified because the runoff termination point (question 6b) was not properly noted on the form.

APPENDIX D

ECOLOGICAL SCOPING CHECKLIST

ECOLOGICAL SCOPING CHECKLIST
PART A

SCOPING MEETING DOCUMENTATION

Site ID	PRS 03-056(c)
Form of site releases. Describe all relevant known or suspected <u>mechanisms</u> of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential <u>areas</u> of release. Reference locations on a map as appropriate.	The southern portion of the site was used as a storage area for electrical equipment, capacitors, and transformers with PCB-contaminated dielectric fluids. Waste solvent was stored there in unmarked drums from 1967 to 1992. The PRS extends steeply downgradient to the west and north from the relatively level storage area. Leaks and spills from the stored equipment and drums are the known and suspected mechanisms of release at the site.
List of Primary Affected Media **(Indicate all that apply)**	**Surface soil** – X **Surface water/sediment**– **Subsurface** – X **Groundwater** – **Other; explain** –
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply)**	**Water** – **Bare ground/unvegetated** – **Spruce/fir/aspen/mixed conifer** – X **Ponderosa pine** – X **Piñon juniper/juniper savannah** – **Grassland/shrubland** – **Developed** – X (very small portion of site)
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	Although no significant breeding or foraging habitats for T&E species are likely to exist at the site, a T&E review for PRS 03-056(c) has been requested from ESH-20. The ESH-20 response will be included in a revised ecological scoping checklist that will be included in the VCA completion report.
Provide list of Neighboring/ Contiguous/ Upgradient sites and include a brief summary of COPCs and the form of releases for relevant sites; reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening)**	PRS 03-012(b), which is the outfall from the power plant and provides much of the flow in the drainage that forms the western and northern boundary of PRS 03-056(c), is upgradient from the site. PCBs have been detected at the upgradient PRS, although the most significant transport pathway [i.e., the creek flowing from the power plant outfall, from PRS 03-012(b)] does not affect PRS 03-056(c) directly. No additional PRSs will be considered in this scoping checklist because the checklist is being used to assist in the performance of a VCA at PRS 03-056(c).

Site ID	PRS 03-056(c)
Surface Water Erosion Potential Information **Summarize information from AP 4.5 or SOP 2.01, including the run-off subscore (maximum of 46), terminal point of surface water transport, slope, and surface water run-on sources.**	Runoff subscore = 22.6/46 Surface water transport terminates in creek along western and northern boundaries of PRS 03-056(c) Slope = average 10–30 % (several locations have slopes > 30%); Surface water run-on subscore = 7/11 Site setting subscore = 36.5/43 Total erosion matrix score = 69.7/100
Other Scoping Meeting Notes	The history of the site, including the regulatory actions associated with previous remediation and the proposed VCA, was reviewed. Maps and data from previous sampling investigations and the extent of previous soil removal were also reviewed.

ECOLOGICAL SCOPING CHECKLIST
PART B

SITE VISIT DOCUMENTATION

Site ID	PRS 03-056(c)
Date of Site Visit	June 29, 1999
Site Visit Conducted by	Toby Walters, Debbie Risberg, Don Kellett; all of IT Corporation

Receptor Information:

Estimate of cover	**Relative vegetative cover (high, medium, low, none)** = high, with isolated areas of exposed bedrock **Relative wetland cover (high, medium, low, none)** = none **Relative structures/asphalt, etc. cover (high, medium, low, none)** = low; some asphalt remains on the electrical equipment storage area
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	Vegetation at the site is a mix of ponderosa pine, Douglas fir, and Gambel oak, with a relatively high diversity of forest understory species, including several shrub species and grasses.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject-matter expert to support the use of the site by T&E receptors.	The only likely T&E species' use of the site is occasional foraging from avian species with large foraging areas (e.g., Mexican spotted owl, peregrine falcon). It is not likely that any other T&E species use the habitats at PRS 03-056(c). An ESH-20 T&E review has been requested and will be included in a revised ecological scoping checklist to be included in the VCA completion report.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors, terrestrial and aquatic, and make notes on the quality of habitat present at the site.**	Yes, terrestrial receptors common to the woodlands at LANL, including elk, deer, carnivorous mammals, herbivorous rodents, and a number of avian species, are likely to use the site. The site is high-quality wildlife habitat with a predominantly northwest to north aspect that provides a cooler microclimate suitable for denser vegetative cover and greater community diversity than the warmer and drier mesa tops and south-facing slopes. Browse plants are numerous, as are several shrub species bearing fruits and berries.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	The erosion potential at the site is relatively high. Drainage channels are well defined and, in some cases, are incised in the soil down to the tuff surface. By moving along these channels, surface water may be transported a short distance to the flowing creek in Sandia Canyon that bounds PRS 03-056(c) on the west and north.
Are there any off-site transport pathways (surface water, air, or groundwater)? **Provide explanation**	Yes, the existing surface water pathways are likely to provide off-site transport beyond the bounds of PRS 03-056(c). Erosion control measures, including run-on diversion berms, hay bale berms, settling barriers in drainage channels, a silt fence, and Curlex™ erosion control blankets, are currently present on the site.

ECOLOGICAL SCOPING CHECKLIST
PART B

SITE VISIT DOCUMENTATION
(CONTINUED)

Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to Project Lead for IA SMDP.**	The proposed VCA will reduce contamination on the site and install engineered controls (if necessary) so that run-off and/or off-site transport is minimized.
Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	The site underwent an Expedited Cleanup (EC) in 1995, which removed approximately 1000 yd^3 of PCB-contaminated soil from the North and West slopes. Most of this soil removal occurred on the North and West slopes. The West Slope is currently barren of vegetation and is covered with a Curlex™ blanket. The North Slope is also covered by a Curlex™ blanket, but has several trees intermittently distributed across the slope.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance).**	Yes, vegetation and the supporting soils on the North and West slopes were removed during the 1995 EC. These slopes are currently covered with erosion control blankets. No ecological effects directly related to contamination were observed during the site visit.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.**	No, the proposed VCA is intended to mitigate any potential ecological effects.

ECOLOGICAL SCOPING CHECKLIST
PART B

SITE VISIT DOCUMENTATION
(CONTINUED)

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport.

In addition to reducing the residual PCB contamination at the site to 1.0 ppm, or below, the VCA will effectively interrupt the complete exposure pathways that may currently exist at PRS 03-056(c). PCB-contaminated soil will be removed from the site as a result of the VCA. Although it is possible that PCBs will remain within the underlying tuff, the tuff will not be removed because the ecological damage resulting from such removal would be too great. It is not likely that the exposure pathways within the tuff are complete. Additionally, the relatively immobile characteristics that PCBs take on once they have entered the tuff will help mitigate exposure concerns about any residual PCB concentration in the tuff. The areas where soil will be removed to the soil/tuff interface, including the North and West slopes, will be backfilled with clean soil. These reconstructed slopes will be engineered to ensure slope stability. A vegetated cover will then be placed on the stabilized slopes to prevent soil erosion. In addition, a 4-in.-thick asphalt cover will be placed over the electrical equipment storage area, upgradient from the North and West slopes. Stormwater run-on path and the drainage areas upgradient from the site will be reconstructed to promote a channel flow that bypasses PRS 03-056(c) on its path to Sandia Canyon.

Under current conditions, receptors may be exposed to PCBs through the following complete exposure pathways:

1. Incidental ingestion of soil by foraging animals
2. Food web transport via ingestion of contaminated soil, contaminated plants, or prey
3. Inhalation of dust generated during foraging, burrowing, or by wind movement
4. Plant exposure to PCBs from surface splash or root uptake
5. Transport of contaminated soil to aquatic ecological communities
6. Mass wasting as a potential release mechanism for subsurface material

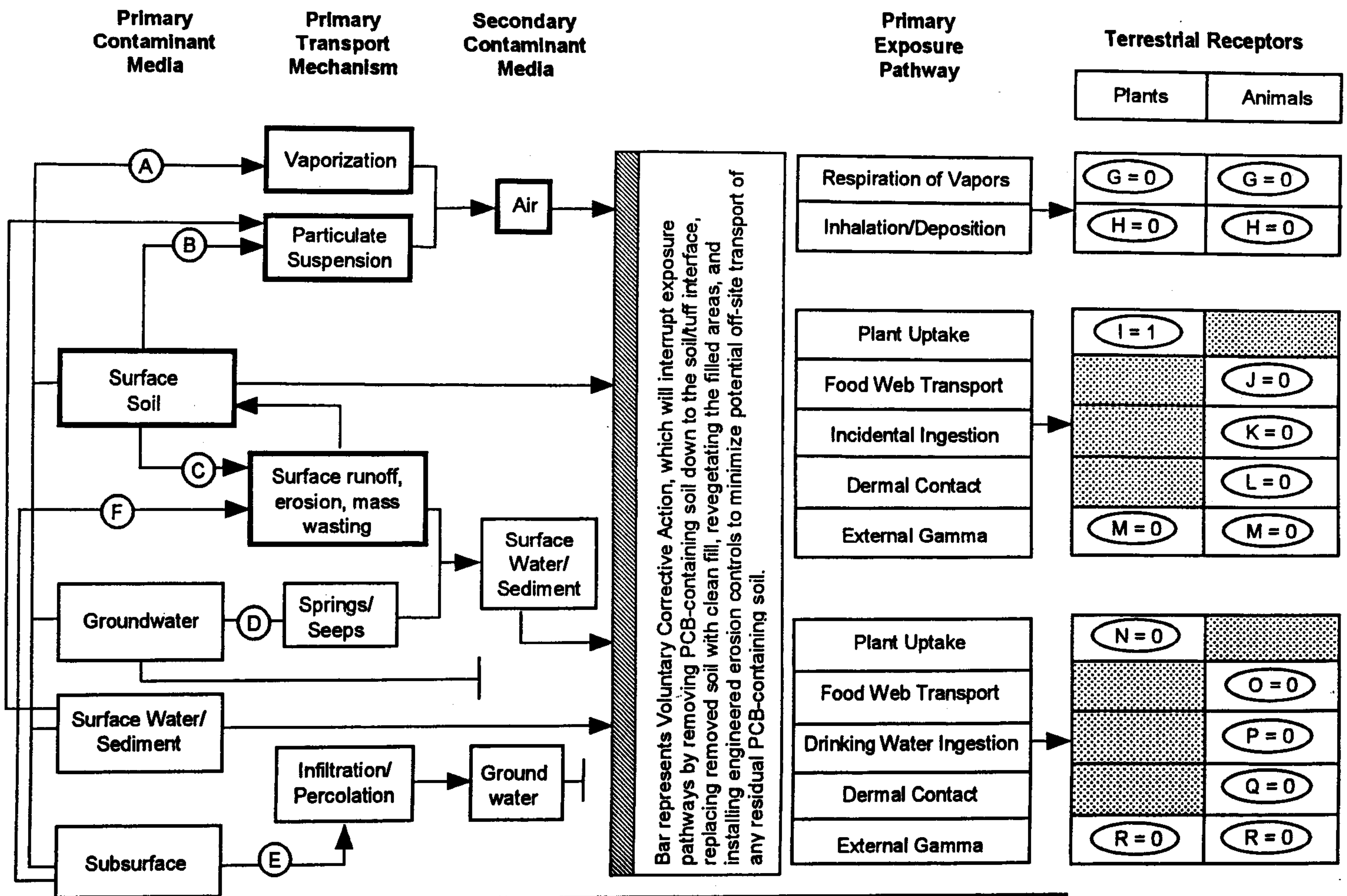
The exposure pathways will be removed as a result of the VCA. The exposure pathways described in 1, 2, and 3 will become incomplete upon removal of the contaminated soil and placement of clean soil and a vegetative cover. The surface splash element of pathway 4 will be eliminated with the removal of soil. Although it is possible that some plant roots may exist within cracks or crevices in the tuff, it is not expected that root uptake will present a significant exposure pathway, either for the plants or as primary elements in food web transport. Pathway 5 will be interrupted with the removal of contaminated soil, the installation of the erosion control measures in the drainage pathways, and the rerouting of surface water run-on to inhibit runoff. Pathway 6 will be mitigated by the placement of an asphalt cover over the storage area, where mass wasting has the potential to occur.

As a result of the VCA, the exposure pathways that are currently complete will no longer provide means for adverse PCB exposure to ecological receptors within the bounds of the site. Consequently, with regard to potential ecological risk, and pending successful completion of the VCA, PRS 03-056(c) will be a candidate for NFA.

Ecological Scoping Checklist: PRS 3-056(c)
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

KEY
0 - No Pathway
1 - Unlikely Pathway
2 - Minor Pathway
3 - Major Pathway

Letters correspond to questions on Part C, Ecological Scoping Checklist; numerals to Key.



Bold boxes represent potential media and transport mechanisms present at PRS 3-056(c).

Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): Don Kellett

Name (signature):

Organization: IT Corporation

Phone number: 505-661-5206

Date completed: Site visit, June 29, 1999; checklist completed July 6, 1999

Verification by a member of ER Project Ecological Risk Task Team (provide name, organization and phone number):

Name (printed):

Name (signature):

Organization:

Phone number:

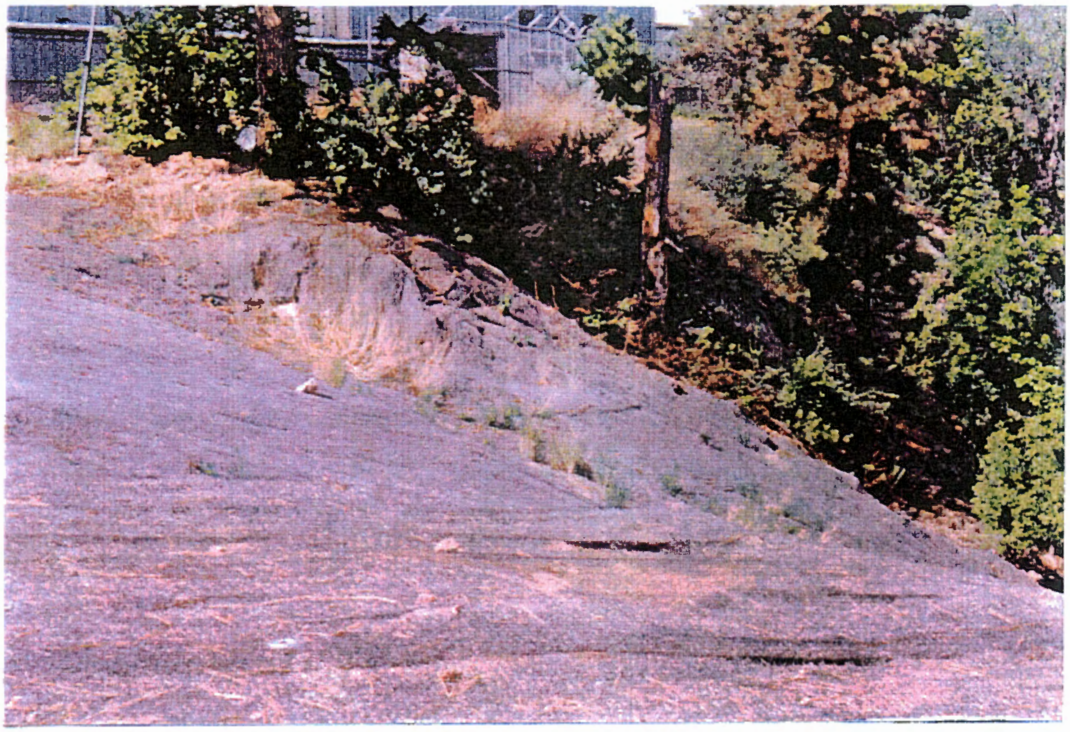


Figure 2.1-1. Photograph of West Slope Area.

Figure 2.1-2. Photograph of North Slope Area.